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ABSTRACT

The Water in Africa Project was realized over a 2-year period by a team of Peace Corps volunteers, World Wise Schools (WWS) classroom teachers, and WWS staff members. As part of an expanded, detailed design, resources were collected from over 90 volunteers serving in African countries, photos and stories were prepared, and standards-based learning units were created for K-12 students. Intended for third to fifth grade students, this unit uses children's interactions with water to help them compare and contrast their lives with those of children in Kenya and Tanzania. It looks at the ways access to water helps define children's roles in the family, and how this shapes culture. The unit contains many photos of daily activities in Kenya and Tanzania. Students will write essays and create pictures to demonstrate their understanding of the concepts. The unit can be used in language arts, geography, art, or mathematics classes. Four to six 40-minute classes are suggested for completion. The unit lists materials needed, outlines applicable standards, poses discussion questions, and gives student objectives. It details day-by-day procedures for the teacher, suggests assessment and follow-up/enrichment activities, and lists nine print and on-line resources. (BT)

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ED 457 083

World Wise Schools

Water in Africa

Water Uses and Children's Lives in East Africa

http://www.peacecorps.gov/wws/water/africa/lessons/

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Water in Africa is a project of Peace Corps World Wise Schools.

2000

Funded through a grant from the Department of Education, the Water in Africa project was realized over a two year period by a team of Peace Corps Volunteers, World Wise Schools' (WWS) classroom teachers, and WWS staff members. Inspired by an idea of one creative WWS teacher, the project eventually expanded into a detailed design. The development and implementation of the design included the collection of resources from over 90 Volunteers serving in African countries, the preparation of those photos and stories, and the creation of standards-based learning units for K-12 students.

Water Uses and Children's Lives in East Africa

Description:

This unit uses children's interactions with water to help them compare and contrast their lives with those of children in Kenya and Tanzania. It looks at the ways access to water helps define children's roles in the family, and how this shapes culture. Students write essays and create pictures to demonstrate their understanding of the concepts.

Timeframe: Four to six 40-minute classes

Curricular Areas: Language Arts, Geography, Art, Mathematics

Grade Level: Grades 3-5

Materials

- Photos from Kenya and stories from Kenya
- Photos from Tanzania and stories from Tanzania
- Maps of Kenya and Tanzania
- Student Water Log
- Research Graphic Organizer
- Evaluation of End Products - Essay
- Evaluation of End Products - Pictures
- Photo Story Reference Chart - Tanzania
- Photo Story Reference Chart - Kenya
- Lesson plan "The Iceberg" from "Looking at Ourselves and Others"
- Colored Pencils, Crayons, Art Paper, Watercolors, Tempera paint, Markers

Standards

Language Arts Standard 1-- Demonstrates competence in the general skills and strategies of the writing process.

Benchmark-- Prewriting: Uses prewriting strategies to plan written work

Benchmark-- Writes expository compositions

Life Skills Thinking and Reasoning Standard 3--Effectively uses mental processes that are based on identifying similarities and differences (compares, contrasts, classifies)

Benchmark-- Compares people in terms of important ethnic, religious, and cultural characteristics

Geography Standard 10-- Understands the nature and complexity of Earth's cultural mosaics

Benchmark-- Knows the similarities and differences in characteristics of culture in different regions

Benchmark-- Understands How cultures differ in their use of similar environments and resources

Visual Arts Standard 1-- Understands and applies media, techniques, and processes related to the visual arts

Benchmark-- Knows how different media techniques and processes are used to communicate ideas, experiences, and stories

Math Standard 9-- Understands the general nature and uses of mathematics

Benchmark-- Understands that numbers and the operations performed on them can be used to describe things in the real world and predict what might occur

Essential Questions

What is culture?

How does where you live influence your day-to-day existence?

How does access to clean water influence children's lives?

Objectives

Students will:

- identify how water use is a part of life and culture.
- record their daily water usage and compare results with classmates.
- complete the graphic organizer on water and children.
- compose an essay, which compares and contrasts how water impacts children's daily lives in their region with water's impact on children's daily lives in Kenya and Tanzania.
- prepare two pictures to accompany the essay.

Procedure

Procedure Day One

Please Note: There is certainly a need to view this data in the proper context--as well-focused fragments of life in Kenyan and Tanzanian villages. Please caution your students to be good social scientists and avoid over-generalizations because of the lack of statistically significant data. "Some Kenyans carry water long distances from fresh water springs" and "Tanzanian students help their teachers grow vegetables as part of their schooling" are conclusions justified by these particular sources, but are not generalizations that can be applied to all rural Kenyans or

Tanzanians without a much wider, statistically significant sample.

1. To introduce the unit, put a list of activities on the board that are all water-related; such as getting a drink, using the bathroom, washing dishes, taking a shower, watering plants, putting out water for pets, washing hands, cooking spaghetti, etc.

2. Ask the students to look at the list and then decide how the items are the same (comparing) and how the items are different (contrasting). Introduce the terms "compare" and "contrast," and then make two lists from their ideas using "The Same-Comparing" and "Different-Contrasting" for the headings. When the lists are complete, talk about what the students have included on them. Explain that the class will be practicing how to compare and contrast in this unit of study on water and children's lives.

3. Next, review the list of water-related activities and ask the students to add others from their lives, such as car washing and chores (for rural students). Include eating, since a lot of food is significantly water-based. Tell the students they are going to study the impact water makes on their lives in terms of time and energy.

4. Distribute the Water Log.(PDF or RTF) Read the directions with the students. Go over the sample given on the log. Be sure students understand how to keep track of their water usage by filling in the log, and have them record their responses for the day up to the current time. Tell the students that good social scientists need good data, and that they should keep accurate records for the rest of the day. Tell the students they should complete the log for homework, and bring it to class the next day.

5. Finally, review the list of water-related activities on the board again. Ask the students if people all over the world would engage in these activities. Explain that some activities, such as eating, drinking, and cleaning are universally performed by people, but other activities such as car washing and cooking spaghetti may be cultural.

6. Write the word "culture" on the board and explain that in this unit they will be learning about their own culture (from the water logs) and about the cultures in rural Kenya and Tanzania from the photos and stories on the Water in Africa Web site.

7. List the features of culture on the board (e.g., language, social organization, beliefs and customs, forms of shelter/housing, economic activities, modes of transportation, food, attitudes toward environment and resources, technology, clothing styles, education systems--schooling, role of women in society, role of children in society). Explain that the Kenyan and Tanzanian material will provide examples of these items, and that they will be looking specifically at water-related activities, especially the role of children in the culture.

8. Optional: To learn more about culture use the lesson plans found in "Looking at Ourselves and Others," specifically at "The Iceberg" which will help students learn more about the elements of culture.

Procedure Day Two

1. Begin by asking the students their impressions about completing the water log assignment. Ask them if they were surprised by anything while they were recording the data in their logs. Discuss briefly as a large group.

2. Put the students in cooperative groups of four students. Tell the students each group is responsible for looking at each member's log in order to compare/contrast the results with the other members' logs, as they practiced yesterday. In order to compute class averages, have each group compute a mean, median, and mode (if they know this from math) for their group members' total time and number of entries. Instruct them to record results from their comparing/contrasting for their report to the whole class on the similarities, differences, and exceptions. When small groups have completed their work (10-15 minutes), have them report back to the large group. Compute class averages. Discuss notable similarities, differences, and exceptions with the class.

3. Ask the students what their research on water helped them learn about their culture. Refer to the list of cultural components recorded on the board during Day One. Review the meanings of the terms listed, and copy the sample list below on the board.

Feature of Culture	Sample Activity From My Log
Food	Ate soup for supper, watered vegetable garden
Modes of Transportation	Put water in car radiator, sailed a boat
Economic activities	Sold lemonade at a stand, watered fruit trees
Attitudes toward environment and resources	Watered flowers in garden
Beliefs and customs	Used holy water at church

4. Ask the students for examples of activities on their logs that correspond to one or more features of culture on the list. Write them on the board next to the corresponding feature, so students can see the connection.

5. Once each feature of culture has a matching activity, ask the students what conclusions they can possibly draw about their culture from the list. These conclusions could be based on the components of our culture which are affected be water most directly, such as food and transportation and the relatively small amount of time and energy children spend on water-related activities in the United States. They could also consider the impact technology has on water delivery and distribution systems in the U.S., and the indirect methods used to obtain water (turn a faucet, flush a toilet, etc.) They could also consider the importance of water to the culture. For example, one conclusion might be: Water is plentiful and easy to obtain at most homes, restaurants, and businesses. Water is available at school by turning a faucet.

6. Discuss the conclusions. Ask if the students have any additions to these conclusions, based on their own experiences and knowledge of their culture. List all conclusions on a piece of chart paper, to be saved for future use.

7. Tell students they will now be doing research to find out about water-related activities and children's lives in Kenya and Tanzania. Locate Africa on the world map, then find Kenya and Tanzania. Show students the maps of Kenya and Tanzania in detail.

8. Introduce the photos and stories for Kenya and then the photos and stories for Tanzania explaining these are materials from Peace Corps Volunteers who are serving there. Use the "about" section of the Water in Africa Web site as the basis for your explanation. Point out instances of water-related activities in the pictures and the texts. Tell the students that the next day they will be doing their own research on children and water-related activities.

9. Optional-It may be necessary to explain the Peace Corps to your students. The Peace Corps Web site and Peace Corps' Kids World will be helpful in this process.

Procedure Day Three

1. To begin, refer to the Kenya and Tanzania material on the Water in Africa Web site. Show the students the material for Kenya and Tanzania. Tell the students they will be using this material to complete an assignment that will assess how well they can do research, draw conclusions about the research, and use the conclusions to write an essay that compares/contrasts their region's culture in terms of water and children with the cultures in rural Kenya and Tanzania as shown on the Web site.

2. Spend time discussing the essay and pictures that will be the product of their research. For this essay, they must compose two paragraphs which compare and contrast water use by children in East African villages of Kenya and Tanzania with water use by children in the United States. The essay will contain at least six examples of water use, and will consider three factors: time spent, types of activities, and number of activities. Photos and stories from both Kenya and Tanzania should serve as source material for the essays, and at least two cultural components must be cited. Students should draw a picture to accompany each paragraph in the essay. The pictures should illustrate examples cited in the paragraphs on water use and children's lives, illustrating at least two features of culture. They must use both Kenya and Tanzania as sources, and be supported by at least two examples of water use from the photos or stories, to prevent focusing on isolated incidents, in the source materials.

3. Distribute the Research Graphic Organizer (PDF or RTF) and the Photo-Story Reference Charts for Kenya and Tanzania to the students. This Research Graphic Organizer and their own water log will be the resources students use to create their essays and pictures. The organizer will help record what students learn about villages in rural Kenya and Tanzania, and how children use water there. Have students look at the sample entry. Show the photo, KE0210 and go over the sample entries on the graphic organizer.

Discuss how the entries match the information in the photo and how the information fits into the categories on the chart. Use one or two photos and stories from Kenya to provide further samples for the students.

4. Barbara Hinsman's Daily Usage Story is a good example to model note taking. Find her anecdotes at www.peacecorps.gov/wws/water/africa/countries/kenya/dailyusage.html. Demonstrate how to skim through the paragraphs to locate the information on Water and Children (paragraph 5). Fill in the graphic organizer with the students using the information in the table below.

Source	Activity	Time spent	Feature of Culture	Same	Different
D.U.-B.H	A girl, 7 years old is carrying water on her head	Very steep path-about 2-3 hours	Washing clothes		No running

5. Have students complete the graphic organizer during the remainder of the class. Circulate and assist them in this procedure. Ten to twelve notes from photos and stories from both Kenya and Tanzania would be sufficient to complete the assignment. Students can work in small groups to insure that they cover as many sources as possible from the photo-story reference chart lists.

Procedure Day Four

1. This day would be used to finish the research using the Water in Africa Web site and begin writing the essays and preparing the pictures.

2. Once students have completed the research, have them discuss their results in pairs or in small groups. Ask each group member to share his/her list of similarities and differences from the Research Graphic Organizer.

3. Have the group record the conclusions they would make about characteristics of the cultures. Use the question "How would you describe the Kenyan and Tanzanian villages from what you know now about their culture?" Have each group record their results and share them with the large group when all groups are finished. There is certainly a need to view this data in the proper context-as well-focused fragments of life in Kenyan and Tanzanian villages. Please caution your students to be good social scientists and avoid over-generalizations because of the lack of statistically significant data. "Some Kenyans carry water long distances from fresh water springs" and "Tanzanian students help their teachers grow vegetables as part of their schooling" are conclusions justified by these particular sources, but are not generalizations that can be applied to all rural Kenyans or Tanzanians without a much wider, statistically significant sample.

4. Let the large group discuss the conclusions, and record them on a piece of chart paper. Have the students use this material, and the material from Day 2(cultural component list, lists of water-related activities and times, and the list of conclusions about the region's culture) to prepare the essays and pictures. Establish a due date and an audience for the pictures and essays so students might share them with others. Follow the steps in the writing process - drafting, revising, editing, and publishing."

Assessment

Evaluations of the Essay and Evaluations of the Pictures should be used to evaluate student learning.

Follow-up/Enrichment Activities

Use the Web site, Africa Online (for kids only), cited below to learn more about Kenyan children's literature through the Rainbow Magazine.

Investigate a particular ethnic group from Kenya and Tanzania to see how water is viewed in their culture. The books If I Were Masai and The Orphan Boy cited below are a good introduction to one ethnic group, as are Kendall Rondeau and Bryce Sitter's stories at under Water and Culture.

The book, Bringing the Rain to Kapiti Plain, introduces the land of the Nandi.

Learn Swahili - a predominant language in Tanzania (and other countries in East Africa) using the text cited below, and the Africa Online Web site.

Use the photos and stories from other countries on the Water in Africa Web site, especially Ghana and Guinea, to see how children's lives there are impacted by water.

Find a pen-pal class in Africa, possibly through a Peace Corps Volunteer and World Wise schools or Africa Online (for kids only), and survey them using the water log in this unit.

Additional Resources

Africa Online Web site. Links for Kenya and Kids Only. June 2000.
http://www.africaonline.co.ke

Aardema, Verna Bringing the Rain to Kapiti Plain, 1992. New York: Dial Books.

David M. Kennedy Center for International Studies, 1999. "Culturgram--Republic of Kenya,

Culturgram - Republic of Tanzania" Provo, Utah: Brigham Young University

Drinking Water Activities for Teachers and Students. June 2000.
http://www.epa.gov/OGWDW/kids/

Feelings, Muriel L. Jambo Means Hello: Swahili Alphabet Book, 1992. New York: Dial Books.

Feelings, Muriel L. Moja Means One: Swahili Counting Book, 1992. New York: Dial Books.

Mollel, Tolowa M. The Orphan Boy: A Maasai Story, 1995. New York: Clarion Books.

Tanzania's official Web site. June 2000. http://www.tanzania.org

About the Author

Robert Maher has been an elementary teacher in southeast Ohio for 23 years. He has corresponded with Peace Corps Volunteers in Africa through World Wise Schools for 7 years, including the 1999 - 2000 school year. Bob participated in a seminar on Teaching About Africa offered by Ohio University and Ohio State University in 1995, and gave a workshop on teaching about the Maasai as a follow up at the Ohio Council for the Social Studies meeting in 1996.

Photos from Kenya

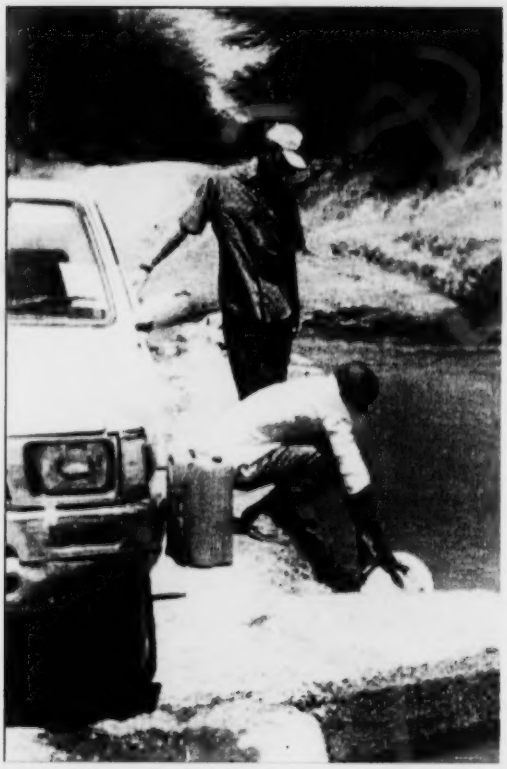
KE0101
PCV Jen Denzin is washing clothes, using one bucket for lathering and one for her two "rinse cycles." We wash clothes about once every two weeks to conserve water. The water is very dirty, but we use it until it almost looks black before changing it.

by Drew Denzin
Ololulunga, Kenya (1999)

KE0102
We collect rainwater in this black tank (400 litres) from our roof. During the rains the water over flows, so we frequently empty it into other buckets.

by Drew Denzin
Ololulunga, Kenya (1999)

Photos from Kenya



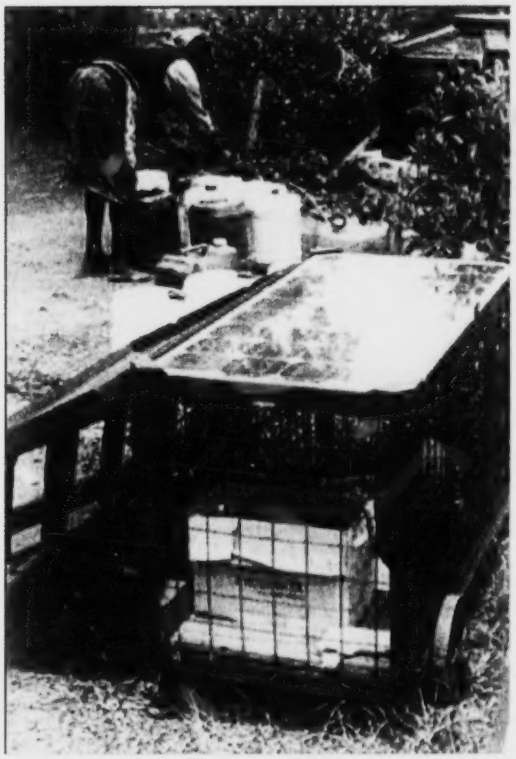
KE0109
PCV Drew Denzin and Calvin are filling water for Calvin's family from the Ewaso Nyiro River. He is filling jerry cans that will last two days. Even though the water is very dirty, it will be used for everything.

by Drew Denzin
Ololulunga, Kenya (1999)

KE0210
It is unusual to see males like this young man fetching water. He is filling a water jug at the Miharati town dam and will use the water to wash clothes.

by Kendall Rondeau
Miharati, Kenya (1999)

Photos from Kenya



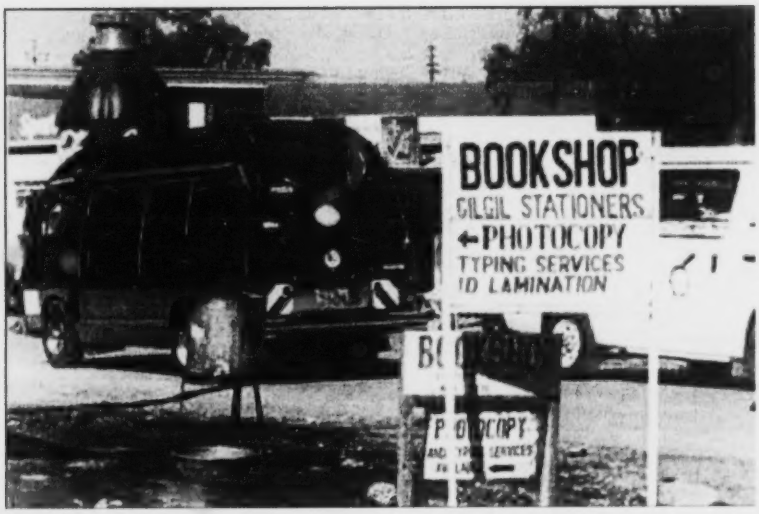
KE0224
Solar panels power the pump that brings water to the black plastic water tank in the background. Solar energy is becoming more and more popular in Kenya although it is still expensive.

by Kendall Rondeau
Gilgil, Rift Valley, Kenya (1999)

KE0226
This man is making paper from local plant fibers (sedges). The fibers are immersed in a basin of water and soda and then are dried on special trays. There is a growing market for homemade paper. It is simple to do and all materials can be found locally.

by Kendall Rondeau
Gilgil, Rift Valley, Kenya (1999

Photos from Kenya

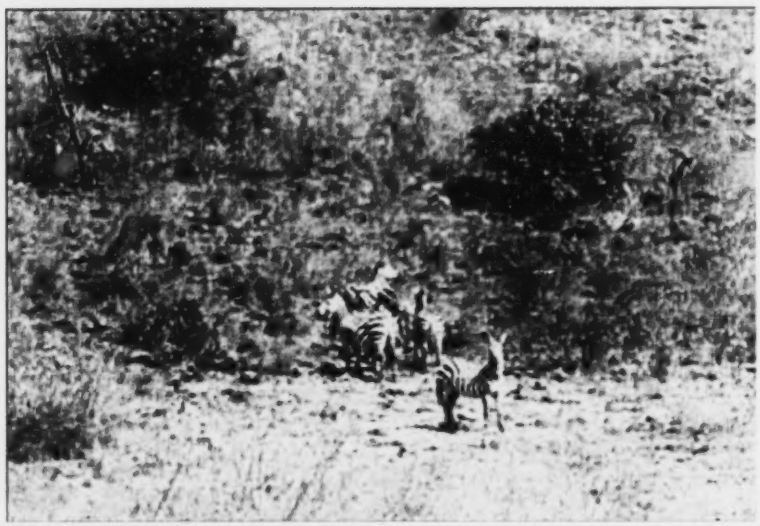


KE0229
The metal container on the beneath it is a common hand washing system at hotelis - (restaurants) in Kenya. This - one holds charcoal in the top to heat the water.

by Kendall Rondeau
Gilgil town, Kenya (1999)

KE0230
Zebras and other animals living in dry areas such as this have to travel long distances for water. Fencing of nearby farms is slowly cutting off animals from water sources.

by Kendall Rondeau
Naivasha, Rift Valley, Kenya (1999)



Photos from Kenya

KE0305
Anthony Wachira is holding a piece of a pipe recently shattered by a herd of elephants. The water pipes lie buried beneath the path leading from the water intake structure to Kangaita Village.

by John and Kim Shumlansky
Mt. Kenya National Forest, Kenya (1999)

KE0307
PCV John Shumlansky views the community cattle dip. The cows are forced to walk down the corridor and then swim across the shallow pool in the process of removing ticks.

by John and Kim Shumlansky
Kiranja, Kenya (1999)

Photos from Kenya

KE0312
PCV Kim Shumlansky is with Mama Jerry in the tea fields. The altitude and heavy rains of Kangaita are good conditions for the tea to grow.

by John and Kim Shumlansky
Kangaita, Kenya (1999)

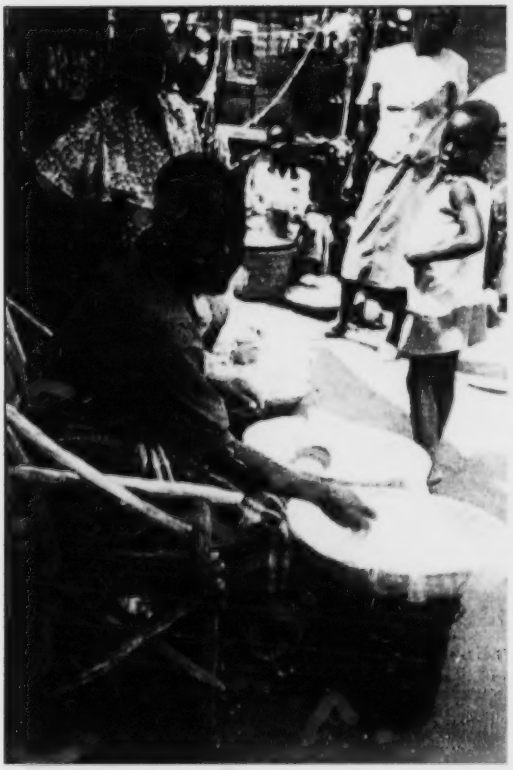
KE0327
PCV John Shumlansky is trying to find a forest path. The paths are grown over within six months if they are not tended or pruned in this dense rain forest.

by John and Kim Shumlansky
Mt. Kenya National Forest, Kenya (1999)

Photos from Kenya

KE0335
The outhouses in Kenya are all squat--style which makes cleaning them with a bucket of water and a straw broom very simple. Small children are not allowed to use outhouses until they are about four, old enough to squat over the opening.

by John and Kim Shumlansky
Kangaita, Kenya (1999)



KE0423
Mama Mary Achieng is selling rice in the market. Rice, which needs a great deal of water to grow, is a major food product of Kenya.

by Melissa Perry
Oyugis, Kenya (1999)

Photos from Kenya

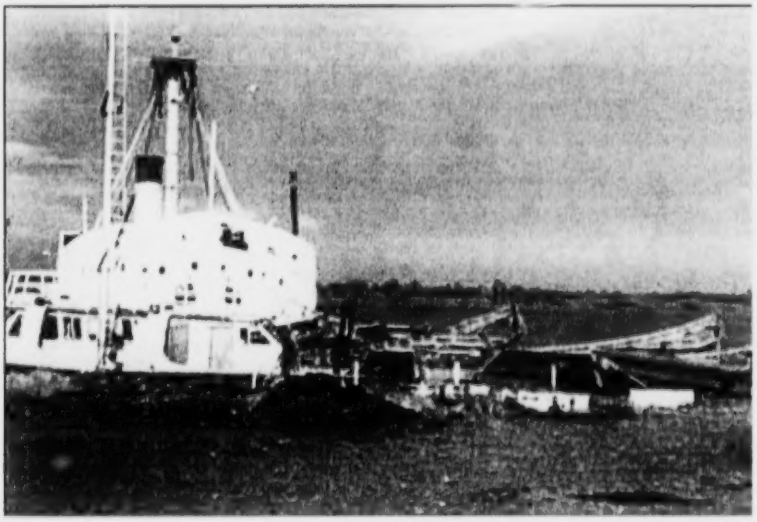
KE0424
Lydia Akinyi is carrying bananas to sell in the market. Bananas are a major crop in Oyugis.

by Melissa Perry
Oyugis, Kenya (1999)

KE0427
Water hyacinth is a weed that makes fishing and transportation on Lake Victoria nearly impossible.

by Melissa Perry
Lake Victoria, Kisumu, Kenya

Photos from Kenya



KE0431
This port is on Lake Victoria. Train tracks lead to the port where boats, including small wooden fishing boats, take the loads from the trains to other ports on the lake.

by Melissa Perry
Lake Victoria, Kisumu, Kenya (1999)

KE0512
These women are waiting to be treated by the mobile health staff all of whom are Maasai, except for myself. Most diseases here are water-born. We treat typhoid, malaria, cholera, worms, scabies, and sexually transmitted diseases. We also vaccinate and monitor babies, and teach families how to protect springs and to boil the water.

by Bryce Sitter
Mobile Clinic, Kajiado, Kenya (1999)

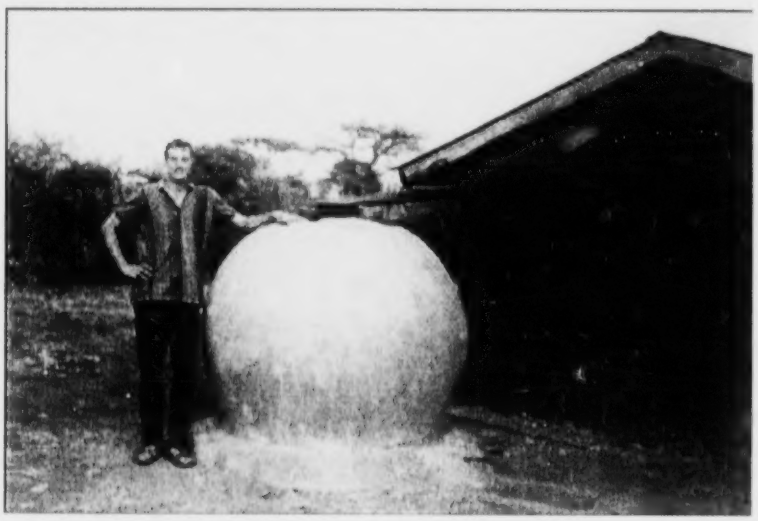
Photos from Kenya

KE0518
The terrain here is flat and dry. The mobile health staff found most of the people had left this area for other wetter places.

by Bryce Sitter
Ololoitikoshi-you (Place of Zebras), Kenya (1999)

KE0526
This is a Ministry of Health water jar we built. We sewed bags together to make one larger bag, filled it with manure and cemented it. Then we removed the dung and made a cover.

by Bryce Sitter
Enkaroni, Kenya (1999)



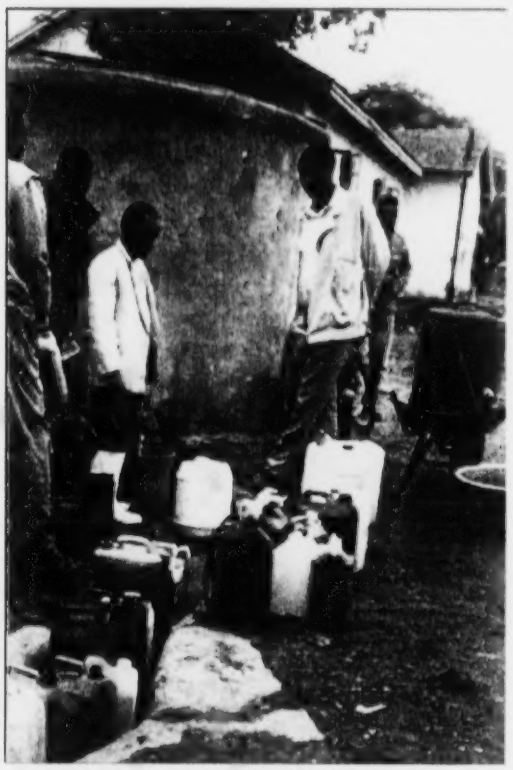
Photos from Kenya

KE0528
This is PCV Bryce Sitter on top of the catchment from the huge roof of the church. Water from it, up to 40,000 liters when full, can last up to six months. It is the only one of its kind around.

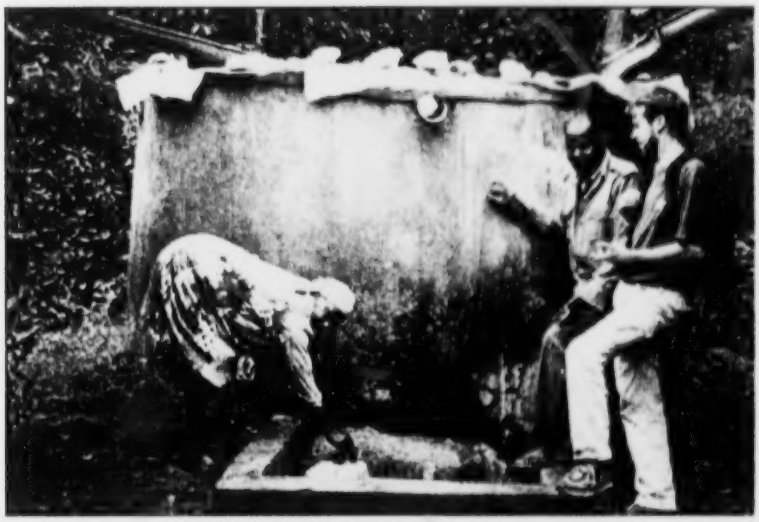
by Bryce Sitter
Catholic Mission, Kajiados
Marvel, Kenya (1999)

KE0535
The hospital's concrete water tank is filled by a lorry (truck) from the next town once or twice a month. It is the hospital's only water tank and is vital to its functioning. These people, lined up to ask for water, are family members of patients.

by Bryce Sitter
Catholic Mission, Kajiado, Kenya
(1999)



Photos from Kenya



KE0608
Joseph and Kathryn Edalia are among some of the wealthier villagers who can afford to build their own water tank to store rainwater harvested from the roof. Here PCV David Frommell advises Joseph Edalia about tank maintenance while Kathryn Edalia collects water.
by Barbara Hinsman
Vigeze Village, Vihiga, Kenya (1999)

KE0612
Makale Sidori, the owner of Lebanon Hoteli, is shown washing his hands. Every hoteli (small restaurant) offers water and soap for customers to wash their hands before and after eating. Kenyans consider it very rude to eat without washing your hands first.

by Barbara Hinsman
Majengo town, Vihiga, Kenya (1999)

Photos from Kenya

KE0618
One Maragoli art form thatstill thrives in Kenya is that of making clay pots, which are then used to carry and store water. Here are (from left to right) Grace Msimbi, Erica Kahega, Nifreda Mbone, and Jessica Nangai, the makers of the pots. (The front row of pots are made for flowers).

by Barbara Hinsman
Kegendirova Village, Vihiga, Kenya (1999)

KE0621
In an effort to save indigenous tree species,
Mama Mary Senelwa (shown with her daughter, Rispa Minayo) has started a tree nursery. Every day the seedlings must be watered and kept under shade to protect them from drying up in the scorching midday sun.

by Barbara Hinsman
Vihiga, Kenya (1999)

Photos from Kenya

KE0623
Two years ago this hill was the Maragoli forest. Now it is a bald, unproductive pile of rocks. Deforestation like this results in severe erosion which quickly damages the watershed.

by Barbara Hinsman
Vihiga, Kenya (1999)

KE0702
During "rush hour" in Mombasa three ferries run to and from the south coast. At other times only one or two are in service.

by Patrick Campbell
Mombasa, Kenya (1999)

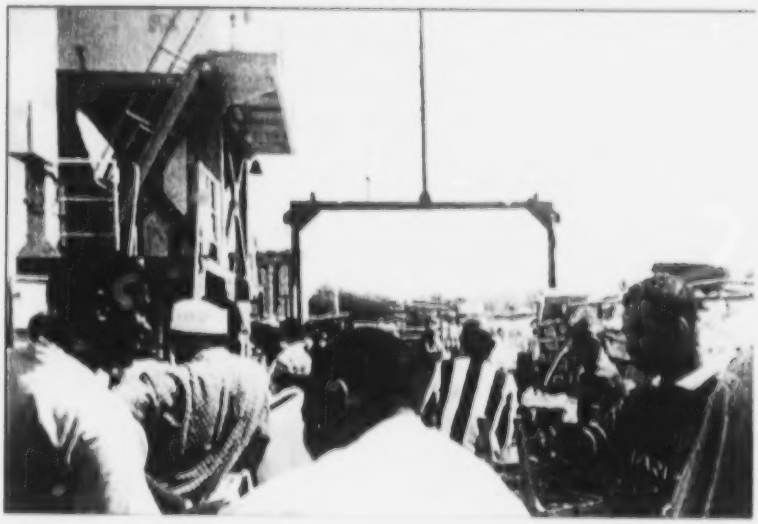
Photos from Kenya

KE0703
This ferry has docked and is unloading on the southern tip of Mombasa island.

by Patrick Campbell
Mombasa, Kenya (1999)

KE0705
The ferry to Mombasa island can accommodate 800 people and 40 vehicles. It is free for pedestrians and bicycles.

by Patrick Campbell
Mombasa, Kenya (1999)



Stories from Kenya

Water and Culture

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by Drew Denzin, Ololulunga, Kenya

My wife (Jen) and I are working with the Maasai community. Traditionally, the Maasai are pastoralists (cattle herders) on land that is extremely arid. Often, they pray to the Christian God for rain for their small gardens consisting of maize and kidney beans.

The Maasai generally use milk for their main drinking; it is easier to get and cleaner than the nearby river. The river is used to clean their cattle as well as water their cattle during the hottest parts of the day. Cattle are by far the most important aspect in the lives of Maasai men, so watering and cleaning them is vital--in fact, the water is used for the cattle more so than for themselves.

One custom among the Masai involving water deals with the penalty for killing another man: If a man kills another he must pay a fine of 49 cows as well as wade across a river. When he reaches the other side he puts on new clothes, symbolizing a fresh start.

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by Kendall Rondeau, Miharati, Kenya

The Maasai believe that if you know five words or more in someone else's language, they can't refuse you drinking water. The Maasai are a pastoral people living in a very hot and arid land. To deny someone water could cause their death.

The Kikuyu people will not let a visitor leave their house without serving them chai. Chai is a tea made with water, milk, tealeaves and sugar. To refuse someone's chai is rude insult.

Every time I go to someone's house, the woman of the house goes off to prepare chai. It is hot and sweet and fights off the chill of the rain and cold mountain air. No business can be done without chai. No guest can leave before at least two cups.

The Kikuyu say that rain is a blessing, as are visitors. It if rains while a visitor is at your home, it is lucky day.

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by John and Kim Shumlansky, Mt. Kenya National Forest, Kenya

The people of Kangaita are mostly of the Kikuyu tribe. Over the years the Kkuyus have discontinued most of their traditional practices and ceremonies, but one water-related tradition is

still remembered by the older members of the village.

The Kikuyus have long believed that rain is a blessing from God. The rains allow local food crops and the many tea plantations in the area to thrive. Without rain many people would have no food and no source of income.

Long ago during times of drought, the elder men in the village performed a religious ritual to pray for rain. The elders would select a special, hidden spot in the Mt. Kenya forest where they would go to pray to Ngai (God in the Kikuyu language). Before going into the forest, the men would spend times away from their family and friends. After this time of solitude, the elder men would travel into the forest to their secret spot and pray. Everyone else in the village was forbidden from entering the forest during this time. Since it is believed that Mt. Kenya is the "Seat of Ngai" the men would face Mt. Kenya during the entire ceremony. After praying, the men would slaughter a sheep or goat of one color only as a sacrifice to Ngai. This ritual was then believed to instill God's sympathy to bring rain to the people.

A famous book by Jomo Kenyatta, the first president of Kenya, is entitled Facing Mt. Kenya and describes similar beliefs, rituals and ceremonies by the Kikuyu people over the years.

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by Melissa Perry, Oyugis, Kenya

The only religious ceremony I can think of pertaining to water is baptisms. Many local churches still go down to the river to be baptized.

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by Bryce Sitter, Mobile Clinic, Kajiado, Kenya

The value of water is top priority for the Masai. The Masai resemble the Native Americans in that their life revolves around the cows, (buffalo for the Native Americans) and tending for them. Everything they need or use comes from the cow; the dung is even used to construct their homes and is often a fuel source. The Masai live off of blood, milk, and meat, and will spend the day taking the cows to graze and then to water. Most live near a water source. If the source dries up, they will knock down the boma (home) and move to an area where there is water. They have ceremonies for moving, coming of age, naming people, and the "Empolosare" Rain ceremony. This Empolosare ceremony consists of sacrificing a good animal (of one color), and singing and dancing.

The Masai stun me as they stand the whole day under the hot sun without having access to water. I never leave my house without a bottle of water, but they follow their herds across the plains without worry. In their prayers the Masai pray for rain for their animals, rather than for themselves. The women are the only ones allowed to pray for waters for human consumption.

by Barbara Hinsman, Vigeze Village, Vihiga, Kenya

Water plays an essential role in the quickly disappearing traditional circumcision ceremonies of the Maragoli people. The ceremonies take place every ten years and involve any young boys who are nominated by their fathers, usually between the ages of five and fifteen. On the night of the circumcision, the boys are taken down to the river by the village elders and covered entirely with mud. The actual circumcision takes place at the river, and then the boys are taken to a hut in the forest made out of twigs and grass, where they stay together for one month, still covered in mud. Mamas bring them food and water, but otherwise the boys are not allowed to have any visitors. This month is for healing and meditating on what it means to be a man. When the month is over, the boys are then taken back to the river to wash themselves completely clean of the mud, a symbol of washing themselves from boyhood. After the final washing, there is a huge celebration in the village with food and water, dancing and singing to celebrate the boys' entry into manhood.

Unfortunately many cultural uses of water are dying quickly as Kenya becomes westernized. One of these dying traditions acted as a mother's test for her son's chosen wife. The mother would give a clay pot to the girl to go fetch water from the river. If the girl returned with a broken pot and no water, she was not accepted by the mother to be the son's wife and another girl would have to be chosen.

The making of clay pots is one of the only art forms of the Margolis which has not died out completely. Traditionally mamas and girls used these pots to fetch water from the river, but these days they are 20 litre plastic "jerry cans," which do not break so easily. Clay pots are now kept in the home for water storage. Since the pots keep any contents inside very cool, many people use them as a form of refrigeration. Boiled water is stored inside to be used for drinking and cooking. Some people even store containers of milk in the cool water, and the milk can be kept fresh for days.

Maragoli children like to sing songs while they work. One such song is traditionally sung while fetching water at the spring or river. It is the story of children who, while fetching water, run into a monkey. They ask the monkey to fetch some water for them, so they can play instead of doing their work. The monkey returns with dirty water, however, and the children respond by throwing the dirty water on the monkey. They then go and fetch clean water for themselves to take home to mama.

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by Patrick Campbell, Mombasa, Kenya

In all of Kenya rain and water are central issues. When Kenyans greet each other there is an exchange of question about life, family, work, and "in the bush" one of the question at the top of the list will often be, "Is it raining in your area?"

Rain is considered a blessing from above. Many of the tribes/ethnic groups have a designated

rainmaker — "mganga wa fula" or "magician of rain," here on the coast. After the planting is finished rituals and ceremonies are performed to bring the rain. Rainmakers are also called upon during times of drought.

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by David Frommell, Bagoo, Rift Valley Province, Kenya

"Blessing from an Mzee (Elder)" When a young couple from the Kipsigis tribe of Kenya wish to marry, they arrange a ceremony along with their parents; much time and money is invested in the event. Traditional and modern elements mix together during the ceremony, providing a colorful and fun-filled day.

The eldest man in the village, called an "mzee" (mmzáy), will bless the young couple. He selects a gourd of high quality in which to mix the blessing elixir. As the mzee hollows and decorates the gourd, community members prepare the ceremonial brew. Maize meal mixed with water is buried for three weeks to ferment. When it is ready, it is roasted and mixed with fermented millet and water to complete the drink.

On the wedding day, the mzee fills his gourd with water and a small amount of milk. He sets the gourd aside as he dresses for the wedding. He wears traditional clothing, including cowhide, a wool cap, and a cow-tail fly swatter.

The wedding ceremony itself begins with Christian celebrations. The bride and groom are given a blessing. First, they sit and drink traditional brew from a clay pot using long, wooden straws. The group then begins to dance. The mzee now takes a mouthful of the water-milk mixture from the gourd. He approaches the couple and sprays them with the mixture from his mouth. After blessing the couple, the mzee continues to bless the entire community in the same manner. Only then is the ceremony complete.

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by Glenna Snider, Osorongai, Kenya

I live among the Nandi people (on of the Kalenjin tribes). There is a lot of water in my area in the form of rivers, streams, and springs. Unfortunately, it is mostly contaminated as little effort is made to keep the livestock away from the water source.

The Kalenjin are primarily concerned with raising livestock; they value milk highly. If you are invited into someone's home, and they do not offer milk to drink, it is considered to be an insult.

During the month of December the young men who will partake in the initiation ceremony (entry into manhood) disappear into the bush for the whole month. They usually stay close to the river, as the foliage is thick and provides excellent cover. They do not want to be seen by anyone during the initiation period.

The Source of your Water

by Drew Denzin, Ololulunga, Kenya

We have two sources of water: rain and the nearby river. We try to collect as much rainwater as possible through gutters and tanks by our house. There are two rainy seasons, a long one (2-3 months) and a short one (1-2 months), so during those times water is abundant. However, due to climate changes, the seasons have shortened: For 6-8 months of the year, it is extremely arid. During those times we must have water brought from the river on donkeys. This water is extremely dirty and requires the use of alum, a substance that when added to water causes the dirt particles to settle at the bottom of the tank, giving us semi-clear water. The water from the river is polluted with human/cattle waste, pesticides, as well as general garbage. It must be cleared with alum, boiled, then filtered again. The rainwater is clearer but still requires filtering/ boiling before drinking.The general availability of water is low, which affects our ability to wash clothes and bathe during the dry months.

by Kendall Rondeau, Miharati, Kenya

I live in an area rich with water. My town is called Manjohi and is located above 8000 ft., along the Western base of the Aberdare Mountains. This is a high area rich with many flowing rivers and fertile soil. The water pours down from the Aberdares, a protected national park, and is cold, clear, and clean. Many people drink it untreated but I always purify mine. It tastes delicious!

Many of the farmers have joined together in water projects bringing piped water to most farms. Although it is expensive, this piped water greatly reduces the time it takes to fetch water from the river. I live on a health center compound. We have piped water in the clinic and in the staff housing. Those who don't have piped water must go fetch it from a river never far away.

It rains three quarters of the year. Our dry months are from December to March. The water table drops but we are never without. Many people also use roof catchment systems. Rain water flows down the tin roof sheets into gutters that funnel the water into storage tanks. This seems to be the most environmentally sounds way of harvesting water. Unfortunately, with the ever-increasing deforestation and global climate change, this area is experiencing less and less rain.

by John and Kim Shumlansky, Mt. Kenya National Forest, Kenya

The village of Kangaita (pronounced can-guy-ee-ta) is located on the southern slopes of Mt. Kenya, the second highest mountain in Africa. Because of Kangaita's proximity to the mountain, it has plenty of rain and many nearby streams that run off the mountain.

The people of Kangaita, including us, obtain water form a small stream inside the Mt. Kenya

national forest. In 1998 the community obtained funding from the U.S. Peace Corps to build a water collection structure and a 2-km pipeline that brings water from the forest stream to our village of 250 people.

The quality of our water is fairly good. Since the source of our water is above human settlement and animal grazing it stays relatively clean and clear. The only time the water becomes very dirty is when the forest elephants decide to bathe in the stream above our intake structure.

The water supply is more than we can use. The heavy rains and melting glacier on the top of Mt. Kenya provide an uninterrupted, year-round supply of water.

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by Melissa Perry, Oyugis, Kenya

In my town water is easily accessible and available because of businesses the local people have made out of water supply. There are many individuals and groups who provide this service. They go to the river or spring to fetch the water then bring it to town to sell. The cost is about 15 shillings for 2 twenty-gallon jugs of water. Many people also have built roof catchement water tanks by their houses. The supply of rain is fairly good except during the very dry seasons (December & January).

In a typical day I use about 6 gallons of water--2 gallons for bathing using a cup and a bucket, 1 gallon for drinking, 1.5 gallons for washing dishes, 1.5 for cooking. On laundry day I use about 25-30 gallons of water. With my laundry water I clean the floors of my house. I catch rainwater in a bucket to water my flowers and plants. I don't have a toilet so therefore I don't use water for flushing. I have a choo (pit latrine/outhouse).

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by Bryce Sitter, Mobile Clinic, Kajiado, Kenya

As the crow flies, my home of Kajiado is about 175 km from the largest mountain in Africa, Mt. Kilimanjaro. The Noultouresh spring comes from that mountain and is pumped to use through underground pipes. This is our main source of water, but unfortunately the output here in Kajiada. Is very small. People, businesses and factories in villages along the pipeline have spliced into it so much that we only get access to water for two or three hours a week, sometimes less. Recent enterprises like flower farms, chicken farms, and a cement factory exploit the water that was intended for domestic human use. When the water comes through the tap, everything is dropped and people run for buckets, bowls and anything that holds water. It is often chaotic and fights do break out.

We try to reuse the water to conserve in any means possible. I use my water from hand washing clothes or dishes to clean the table or floor. We can't grow vegetables or even flowers. Underground estuaries lie 250 meters below ground and through bedrock, so we can't dig wells. Water is a major concern/worry for people. I am constantly thinking about water here. If you can speak seven words in someone's language, however, they cannot deny you drinking water.

We get an average of 502-mm rainfall a year. In one year and two months here, I have only felt rain seven or eight times. Rain fills pans and dams, which are used to water cows. This is 4 % of our water supply; 27 % of our water is now from dug bore holes/wells; 70% of the supply is piped. A few people try catchment but with little luck. Due to high temperatures during the day, the evaporation rate is very high. Ninety-five percent of surface water is seasonal and very unreliable.

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by Barbara Hinsman, Vigeze Village, Vihiga, Kenya

Although my house in Kenya has pipes, this does not guarantee that water comes through them. I live in Western Kenya's Vihiga District, which is one of the most densely populated areas of the world with over 110 people/km2 . Therefore elements of infrastructure in Vihiga such as piped water systems, which were built in the past, are no longer adequate enough to supply the exploding population. The solution? Ration water by days. Mine is supposed to come for a couple of hours on Wednesday and Friday mornings, but it rarely comes on schedule, if at all.

On a "water morning" (whether it is scheduled to come that day or not) water trickles slowly out of one tap in the backyard. Pipes leading to the kitchen and bathroom stay dry due to low water pressure. I must remain at home these mornings and collect as much water as possible to store in plastic containers, for I have no way of knowing when it will come again. Tap water looks, smells, and tastes clean, but still I boil and filter it before drinking, just to be safe.

If the tap stays dry much longer than a week, I must resort to harvesting rainwater. Luckily Vihiga is high potential area--it rains here most months of the year. I have spent many evenings eagerly watching the sky, hoping that the rains will come to fill my basins. Rain water that runs off of the overhanging roof is noticeably dirtier than the tap water, but after boiling and filtering it this water is very much potable.

During the dry season (December-February), both tap water and rain are difficult to come by. My plastic containers run dry. Simple tasks like cooking, washing dishes and clothes must be postponed so that I can ration the little water I have between drinking and bathing. As a last resort I must buy water from the mamas who fetch it at the river. This water can be used around the house, but I will not consume it. One time the water I received from the river smelled like gasoline.

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by Patrick Campbell, Mombasa, Kenya

Mombasa is an island in the Indian Ocean populated by about 500,000 people. Living at almost sea level surrounded by the ocean means that the water in our water table is very saline. As a result our water must be piped in from the mainland. Most of our water comes from Mzima Springs in Tsave National Park (about 200 km away). From there it is piped to Mazeras (about 20 km away) where it is treated at the reservoir. While the water is generally considered safe, many people (like myself) take the precaution of boiling drinking water. Water vendors offer

another source of water as well. They push a cart around town selling water (usually tap) for between five shillings (7 cents) to fifty shillings (67 cents) for twenty liters, the price depending how scarce the water is at the time.

I am one of the lucky volunteers who have running water, although not as reliable as one would imagine. In fact, as I write this I have been without water for two days. This is common throughout Kenya, so people have adapted methods to compensate. The building I live in, for example, has tanks on the roof that fill when the water is working and store it until the water is not coming through the pipes for whatever reason. These tanks are connected to the plumbing in the building and help maintain a more constant water supply. However, if the water does not come back on within a few hours the tanks are depleted and the residents of the building are left to find their own sources of water until the piped water returns. Many of the people, myself included, have plastic barrels that we fill when the water is on and use when the water is off.

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by David Frommell, Bagoo, Rift Valley Province, Kenya

The people of Kericho District in Kenya's Rift Valley Province enjoy an annual rainfall of 1000 mm to 2000 mm, the equivalent of 3.25 to 6.5 feet. In fact, rain falls every day in Kericho, usually during the afternoon. The hilly geology of the District results in continual flow of many small and medium-sized rivers. Kericho Town draws its water from one of these local rivers. The water intake is located in the Mau Forest, one of the few remaining natural forests in Kenya. From the intake, pumps drive water to a modern treatment facility. Kericho is one of the only towns of its size in Kenya to employ such a treatment works.

My house, located near Kericho Town, is supplied with piped water from the treatment system. The water flows clear and cold and tastes pure. Despite the good water quality at my home, I boil water for drinking to ensure that all pathogens are deactivated.

Kericho District has abundant water resources. The government Ministries of Health and Water supervise development of water resources. Community water supplies throughout the District incorporate rivers, wells, springs, and rooftop rainwater collection to ensure enough clean water is available to community members.

At times, the volume of water in Kericho District causes problems. El Niño rains during 1997 contributed to the degradation of many roads within Kericho. Standing water creates explosions in the numbers of mosquitoes and subsequently, in the number of malaria cases. The people of Kericho District will continue to be challenged in future years to develop their water resources in a positive manner.

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by Glenna Snider, Osorongai, Kenya

The water that I use personally is collected in a cement tank. It is rainwater, which is directed into the tank by gutters. I filter the water, then boil it before I drink it. I just use the rainwater

directly from the tank to wash dishes and clothes.

Most of the people in my location cannot afford a water catchment system (gutters and storage jar or tank), so they use the water from the rivers, streams, springs, and dams. As a result of not boiling the water before they drink it, there are many cases of water-born diseases.

During the dry season (December through March), my tank was also dry. I had used all the water, and there were no rains to fill it. I used a wheelbarrow to transport the twenty-liter containers of water from the nearby dam. I could not carry the container on my head, as the women do!

Daily Usage

by Drew Denzin, Ololulunga, Kenya

Our daily usage of water is extremely low compared to use in the U.S. We have no running water and no flushing toilet so we conserve quite a bit of water. In the morning, we brush our teeth using 1 cup of water, wash our faces with about 2 cups of water (we both use the same water) and are off to school. At school there also is no running water, so tea is served at 11:00 am, then we are home for lunch. We drink water (or Kool-Aid) with lunch, then return to teach. At night we cook with water (boiling noodles, rice, etc.) as well as boil water for bathing. We take the boiling water and add cold water until it is nice and warm, then splash bath using three gallons of water each. We collect the bath water and kitchen water in buckets to use it for watering our garden, so we reuse as much as possible.

Our community is much like us in terms of water usage. Our neighbors may go to the river to bathe or wash clothes. Water is scarce and it is safer to drink soda or tea rather than the river water. Everyone relies on rainwater for watering crops and only the rich can afford to collect and store rain water for personal use.

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by Kendall Rondeau, Miharati, Kenya

Water here is precious. Yet people still continue to waste it. They seem to feel that--since there are so many rivers flowing year round--it's an unlimited source. They aren't thinking of the people downstream who are suffering because those up stream are taking too much.

I have tap water and a flush toilet. I find myself using a lot of water because I have a constant (and easy) source. We use water here just like in America--for drinking, cooking, cleaning dishes, laundry and the house. We also use water in our garden to keep our vegetable and tree seedlings alive when there's no rain.

There are times when water from the tap does not come. That's when I put on my big and bulky "gum" boots and walk down to the river. I scramble down the muddy bank and get in the river. I can feel the cold temperature through my boots. I ladle pots of water into the 15-liter jug (mtungi) until it's full. Then I struggle back up the bank with the heavy mtungi. I huff and puff the short distance to my house while my amused neighbors smile at me. I've found that I can survive on much less water when fetching--it is such tiresome work. I use one bucket of water to wash dishes and another to rinse. That water can then be used to water the garden or soak dirty clothes!

by John and Kim Shumlansky, Mt. Kenya National Forest, Kenya

The water in our area is plentiful and thus we do not spend a lot of our day collecting, carrying or conserving water. We have a tap that brings water directly into our home and so we can wash clothes, water plants and clean the dishes and the house using little of the day engaged in obtaining water.

Although the community water source is fairly clean, the stream could still contain bacteria and other microorganisms that can cause disease. We therefore drink and cook only with rainwater that we collect from the roof of our home. We collect the rainwater in a tank and then carry it inside where we boil and cool it before drinking. Most people in our village do not have rain tanks so they must rely on the water systems as their only source of water. Some of the villagers boil their drinking water but some are confident enough to drink right from the tap.

Our school gets their water from a piped water system similar to the one in Kangaita. The source of the water is stream that runs through a neighboring community. The water is therefore much dirtier, often dark brown, and more likely to contain disease causing organisms. Students use this water for cleaning purposes and bathing but normally walk to a nearby groundwater source to collect the much cleaner water for drinking.

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by Melissa Perry, Oyugis, Kenya

Before I came to Kenya to live as a Peace Corps Volunteer I never gave much thought to the water I used in the States. I just knew that if I needed water all I had to do was turn on the faucet and there was safe clean drinking water. Since I've come to Kenya I understand more clearly what a luxury it is to have clean running water. In Kenya, I get my water from a spring. If there hasn't been much rain the water comes from a river nearby. I pay a boy 15 shillings (about 20 cents) to fetch the water from the spring. He brings the water in two 20-gallon containers; the containers are placed on the back of his bicycle. The bike ride from the spring to town where I live is about 2 miles. He does this job everyday and he makes around 10-15 trips a day. Therefore he earns around 150-225 shillings a day which equals around 2-3 dollars a day. After I receive the water I have to boil it in order to have drinking water. Most people in my town get their water this way.

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by Bryce Sitter, Mobile Clinic, Kajiado, Kenya

At a nearby technical school, students can learn a trade of metal work, plumbing, or carpentry. They live in dormitories like they might in the States, but here they are given one to two buckets of water in a week. Imagine how much water you use to bathe, wash your clothes, drink, and keep your dorm clean. The terrain is very dry and dusty. We have dust devils (miniature tornadoes) that spin through town and throw a dry "moon dust" everywhere. The soil is red and dirties clothes quickly. I reside at the district hospital where we can only clean once or twice in a

week due to water shortages. There are no toilets that can be flushed, and sanitation is a major problem. We use heavy solvents and cleaners to clean blood, sheets, and toilets (pit latrines). If you come to the hospital to deliver a baby or get stitches, you bring your own water. When you go to a restaurant, you often don't get the option of washing your hands before you eat. A simple pleasure is taking my Friday night splash bath. I use less than a pitcher of water to wash my whole body, while standing in a large tub to collect the dirty runoff water. People sell water when they have access to a vehicle and can go to the other town and get it.

The only plants that can grow here are the heartiest trees and bushes. Acacia Euphorbia and others have sharp needles or poisons as defense mechanisms against camels and goats. The animals too are very tough, and somehow survive on very little nourishment.

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by Barbara Hinsman, Vigeze Village, Vihiga, Kenya

The rising of the sun wakes me at 6:30 am, and I walk drowsy-eyed into the kitchen. I find a large pot on top of the gas stove and congratulate myself for remembering to boil water last night for drinking today. I toss this water into the filter and put about two liters more on the stove to heat for bathing. I also put a small kettle on to boil water for my morning cup of coffee.

Noticing that both of my 50 liter water storage containers are quite low, I check the backyard tap to see if by chance any water is trickling into the 20 liter plastic "jerry can" I can usually leave underneath the spigot. No luck. Today is Friday; tap water has not come in a week. Even worse, rains have been scarce. I guess my mountain of dirty clothes will just have to remain one more day, since it will take at least 20 liters to wash them by hand. What little water I have must be saved for drinking and bathing. But the distant clouds in the East give me hope that the rains might come this afternoon. If not, I'll have to pay a mama to go to the river for me tomorrow.

I remember the day when I tried to fetch water for myself from the river and I laugh. That is exactly what the mamas did too when they saw me struggling miserably to carry a full jerry can of water home. One mama offered to carry it for me, and I couldn't refuse. She lifted it up to her head as if the thing was empty and balanced it so effortlessly! Since that day I have preferred to ask these mamas for help, having realized that it's probably not best to spend all day killing myself trying to accomplish what they can do in ten minutes.

After bathing and eating breakfast I head off to work. My only scheduled appointment today is an hour's walk away with a farmer named Joseph. Joseph started a small tree nursery recently so that he could plant some trees on his hillside farm to prevent soil erosion during the heavy rainy season. Already erosion has swept away most of his nutrient-rich topsoil, resulting in a harvest insufficient for Joseph to feed his own family. I had instructed him earlier on how to construct the seedbed, and I had even given him some seeds of indigenous trees. Unfortunately, I arrive today to find that all the seedlings are dried up and dead. Joseph has made the single most common mistake among my farmers—he has failed to water the seedlings every morning and evening. "The river is so far," he complains to me, sounding very discouraged. I suggest that he move the nursery closer to a reliable water source, or share the nursery with another interested farmer who lives near the river. Delighted by my idea, he decides to try again. We agree to meet

again in a few weeks' time.

On my way home I meet from Brenda, the seven-year-old daughter of my friend Zibborah. Brenda is carrying a bucket of water from local spring, and she looks very tired. No wonder! The very steep path between the spring and her house is severely eroded and difficult to navigate--especially while balancing a bucket of water on her head, I imagine. Brenda explains that this is her sixth trip to the spring today, because Fridays are clothes-washing days.

I follow Brenda home to greet Zibborah, who seems very happy to see me. She claims she is fine but then complains about the lack of rain and how it is ruining her maize crop. Instinctively we both look to the eastern skies and agree the rains will come today.

Zibborah graciously invites me in for lunch. Before eating she brings a pitcher of warm water, a basin and some soap, and she pours the water over my hands as I wash them--a Kenyan ritual before and after every meal. After lunch she offers me some drinking water. Refusing politely, I explain that I have carried my own boiled water, so that I do not get sick. Zibborah is not offended, and we discuss at length the importance of clean drinking water. After hearing my opinions she decides that from now on she will be boiling her water to protect her family from water borne diseases.

The darkening sky and cool winds cue me that it is time to make my departure. If the rain comes while I am here, I'll be stuck until nighttime! I continue my trek home with a bounce in my step, silently thanking the forces that are responsible for bringing us the coming storm. Finally my clothes will be clean! I assumed the farmers are just as grateful as I, for the thirst of their crops, their only sustenance, will be quenched today. I ponder about the necessity of rain for survival here in Kenya. Never before has rain played such a direct role in my own survival. This realization hits me just as the first large, cool drops of rain begin pelting my arms and face.

I reach my front door just as the downpour begins. Once inside, I grab all my basins, pots, jerry cans and containers. I take them outside and place them under strategic spots of the roof where rainwater falls plentifully--I need to collect as much water as possible. Finally, I sit by the window to rest and watch the storm cool off the scorching land. I make a quick mental note to myself: remember to boil water again tonight for drinking tomorrow.

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by Patrick Campbell, Mombasa, Kenya

The first thing I do when I wake up is to check whether or not I have running water. If I do, I fill my three liter kettle and put it on my kerosene stove to boil drinking water for the day. Once again, if I have water I can shower. Otherwise I use water from my one hundred liter barrel, taking three liters to boil and about five liters to "splash bathe," I pour the five liters into a basin, wet myself down, soap myself up, and rinse myself off. The key is to avoid getting soap in the water, otherwise you're stuck with soap in your eyes, trying to get water out of the barrel without getting soap into it and polluting your only source of water (until the water comes back on). A very delicate operation, especially if you can't open your eyes.

I use water for many of the same things I did in the United States (drinking, bathing, washing clothes and dishes, and cleaning my house), the difference is that I use about one fifth of the water for each of these tasks than I did in the States. For example, I can hand wash a load of clothes with about ten liters of water, quite a bit less than my washing machine at home would use. There are days though, when I have sores on my knuckles from hand scrubbing clothes, that I still miss the washing machine.

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by David Frommell, Bagoo, Rift Valley Province, Kenya

6:30 AM: The alarm clock screams above my head in harmony with the rooster outside my window. I groan, and hit the snooze button.

6:38 AM: This time the alarm clock convinces me to get out of bed. I shiver in the chill morning air as I make my way to the bathroom. I use the toilet, but I won't flush until this evening to conserve water. I turn the handle on the faucet until the water begins to flow, just as it does every day. A splash on my face to open my eyes, and a splash on my toothbrush. Not yet feeling awake, or alive for that matter, I stumble into the kitchen in my boxer shorts and slippers. I pour some boiled water into the coffee maker and fill the teakettle from the faucet. I place both of these on the stove to heat.

7:00 AM: After taking my coffee, I pour the hot water from the kettle into a basin for bathing. I add cold water until the temperature is right, and I step into the bathing room for my splash bath. Five to six liters (1.5 gallons) is enough to make me feel and smell clean. After dressing, I fill a one-liter Nalgene bottle with boiled water to carry with me for the day. Most of my community members don't boil drinking water, as they can't afford the fuel (charcoal, wood, or gas) to do so. I pack my day bag, most likely forgetting several important items, and mount my bike to ride the three kilometers (1.8 miles) to town and my office.

10:00 AM: I attend several meetings with my co-workers to make plans for upcoming seminars and field trips. Afterwards, I sit at a crowded table in the Sunshine Hotel, a local restaurant. The waiter mixes hot water and milk in my cup and drops a teabag into the cup to steep. I walk to the basin and wash my hands before eating my midmorning snack. A pitcher of water rests on the table for drinking. I prefer the boiled contents of my Nalgene bottle.

10:30 AM: I board a local bush bus, which is really a pick-up truck with seats in the bed, and pay 20 Kenya Shillings (25 cents U.S.) for the fifteen minute ride to Chebowu, a small market center southwest of town. The bus enters the last gas station before leaving town. An attendant opens the hood of the old, rusted vehicle and pours cold water down the gullet of the thirsty radiator. We are on our way.

10:45 AM: I join my co-worker rose Ngina, on the three-kilometer hike from the asphalt road to Kaptongeno, where a group of farmers awaits our arrival. Along the way we pass a mama carrying a 20-liter jug of water on her head. She has come from the nearby stream. Another kilometer later we overtake a donkey pulling a cart loaded with water jugs. The remainder of the morning will pass before the water reaches its destination.

11:30 AM We begin a meeting with the group of farmers which plans to build a water storage tank. The group already manufactured and installed two hydraulic ram pumps in the local river, along with several kilometers of piping and three distribution points (taps). We plan and assign tasks for the proposal writing phase of the project. The main pump is clogged with debris carried by the river, so today the mamas fetch water from the river manually.

1:30 PM Hoping to avoid the afternoon rains, I leave the group to return to Kericho for lunch. A passing bush bus stops and carries me back to town. I pay a visit to a friend who owns an auto spares business. He offers me lunch. Stepping to the back of his shop, I wash my hands at the spigot. A slug of boiled water after eating helps to wash down the mid-day meal.

3:30 PM After several more meetings, the time has come to bike home. With a pack full of fresh fruits and vegetables for dinner, I climb the hill towards home. I smell rain on the wind, and the large black clouds ahead to the right close fast upon me. I pedal furiously; at 7,200 feet above sea level, the rain in Kericho falls cold. Moments before I arrive at my gate, the first drops strike my arms and face. The security guard lets me in, and the dogs sniff at my bag. Speeding down the hill to my house, I arrive just in time. As I step into the sitting room, the sky opens up releasing a torrential downpour. The electric company cuts the electric service to avoid damages due to lightning and high winds. After lighting the lantern and candle or two, prepare another cup of coffee and sit down to record the day's events. Glancing at the calendar, I check the plan for tomorrow: laundry day. All to be done by hand, of course, in the same basin I bathe in.

10:00 PM After a dinner of falafel and hummus, I wash up and brush my teeth again. I fill one last glass full of boiled water in case I wake up thirsty during the night. The rain has stopped, and the only sound tearing the utter silence of the night is the occasional barking of a dog. I fall asleep reluctantly, knowing that there will be plenty of water for tomorrow's laundry.

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by Glenna Snider, Osorongai, Kenya

I live and work in the same location. I live in the 'interior.' There is no electricity, no piped water, and very few latrines. Most of my time is spent visiting homes and schools in my area. I talk with people about the importance or clean water. The best way to teach is by example. Many of my neighbors are curious about me and my habits, so they closely observe everything I do, and ask a lot of questions.

I am careful with how I use water. When the dry season is approaching, and my tank is no longer filled by rainwater on a daily basis, I start using the rainwater for cooking and drinking only, (after I filter and boil it). I use the water from the dam for washing and bathing.

Managing Water

by Drew Denzin, Ololulunga, Kenya

No one is in charge of managing our local river; it is everyone for themselves. People can take as much as they can carry and bathe or go to the bathroom in the river whenever they want. In terms of families, it is the women's responsibility to get water for their families, wash clothes at the river, and do the cooking with the water.

Farmers pray for water when crops are planted, other than that there isn't anything they do (i.e. irrigation or sprinklers with river water).

by Kendall Rondeau, Miharati, Kenya

In Kenya, water is considered women's work. Women and girls fetch water from the rivers. They do all the cooking and cleaning. They wash the whole family's clothes by hand. They heat the water for bathing and prepare it for the men. It is exhausting work.

by John and Kim Shumlansky, Mt. Kenya National Forest, Kenya

Each family in our village has a water tap near their home. Therefore, each family is responsible with managing the amount of water they use.

In Kangaita and in much of Kenya it is usually the responsibility of women and children to get water for the family. They usually collect the rainwater off a roof or simply fill buckets and pots from the nearby tap. If the water system breaks down and it has rained recently, then the children and women go to the nearby stream and collect water in jerry cans.

Men are now assisting more with the responsibilities previously handled by women, but women are predominantly found washing clothes, cooking, and cleaning around the house. The men in Kangaita are responsible for chores usually involving farming, building and home repairs. The men irrigate their gardens using the water supplied by the community water system. Some of the families even use a homemade sprinkler that allows them to irrigate large areas of their garden during the dryer season.

by Melissa Perry, Oyugis, Kenya

There is no formal system for water management in my town. The boys who deliver water on their bicycles are individuals working for themselves.

There was piped water in my town but since I've been in Oyugis there has not been piped running water. Many homes are equipped with faucets, showers, etc., but they don't work.

Farmers usually try to plant near a river or stream so they can easily fetch water for their crops.

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by Bryce Sitter, Mobile Clinic, Kajiado, Kenya

There is no farming, except a few places in the district where irrigation is possible from wells. The District Water Engineer is in charge of gazetted water schemes. In the home, the woman fetches the water and does all domestic duties with it. The wife gives the husband a gourd of drinking water when she returns home. Women actually have dents in their heads where leather straps from carrying water have shaped their skull. Young men guard the water sources and they are often passed down from generation to generation.

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by Barbara Hinsman, Vigeze Village, Vihiga, Kenya

In Kenyan families the woman is fully responsible for managing water supplies. Mama decides how much water is needed for the day, and then she either goes to fetch it herself, or she sends the children. Girls are most often seen collecting water, but boys can also assist when needed. Then mama delegates how much water is needed for each task. Typical uses for water include drinking, cooking, washing floors, dishes and clothes, bathing, feeding livestock, and watering tree and vegetable seedlings. If, however, the family builds a water tank and roof catchment system, the decision, resources, and labor to build the tank must come from the man of the house.

Farmers in Vihiga rely on the rain rather than irrigating their crops in any way. Two problems that farmers fear are too much rain, and too little rain. Farmers here combat heavy rains by digging trenches to trap heavily flowing water, which is potentially harmful to crops, and by building well-secured terraces on their farms to prevent soil erosion. Lack of rain, on the other hand is more difficult to deal with. If a water source exists nearby, farmers will water the more expensive crops like green vegetables and tomatoes, but maize, the staple food, will be left to dry. Fortunately for the Maragoli people, the dry season here is short, and both drought and famine are uncommon.

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by Patrick Campbell, Mombasa, Kenya

Water in Kenya is managed by the Ministry of Water. In families it is generally a group effort, though the women play a more significant role. The men may use the water for bathing and perhaps irrigation, but women are responsible for the cooking, cleaning, washing of clothes, and supplying drinking water for the family.

Most farmers depend on the rain. Those near a source of water may practice some form of

irrigation, others may dig a borehole which will provide water that is saline, but useable in emergencies.

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by David Frommell, Bagoo, Rift Valley Province, Kenya

Water and its management are issues typically addressed by women in Kericho. The Kipsigis tribe is a patriarchal social unity. The woman's duties include fetching water, if necessary, for use in cleaning, cooking, and farming. The men, upon seeing a need, supply the women with the tools necessary for water-related work: water tanks, piping schemes, pumps, gutters for roof catchment.

Within Kerico Municipality, the Town Council manages the operations of the water works and distribution system. Tasks include treatment, maintenance, sales, and revenue collection.

Generally, farmers in Kerico District rely upon the ample rainfall to irrigate their crops. A drought results in famine, as can extremely heavy rainfall. Farmers in the dryer areas of the District are beginning to design irrigation schemes using local rivers.

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by Glenna Snider, Osorongai, Kenya

Women are responsible for managing water in my community. They collect it, cook, wash, and bathe their children. They are responsible for providing the men with water to drink and bathe. Farming is managed according to the rains. Crops are harvested just as the dry season is beginning, and no crops are planted until the rains begin again. Food is scarce during the dry season. Farmers among the rivers have small-scale irrigation systems. The water is either piped to a small area, or there are a series of ditches that can be opened to the river, to supply water to small areas.

Conservation

by Drew Denzin, Ololulunga, Kenya

There is little to no conservation of water. People may keep rinse water or bath water to water gardens, but other than that most people rely on the availability of the river water. Most people do not even have gutters to collect rainwater, something that would save money, effort, and give them cleaner water.

by Kendall Rondeau, Miharati, Kenya

I do not see a lot of conservation of water. I see a lot of waste. However, sometimes I see recycled water (that had been used to wash hands or dishes) thrown into the garden.

by John and Kim Shumlansky, Mt. Kenya National Forest, Kenya

When you have enough of something it is often difficult to use it wisely. Although our community was familiar with drought and had suffered through water shortages, we soon grew forgetful about the need to conserve water once the new community water system was built. At first we would find people, including ourselves, leaving taps running and forgetting to repair broken pipes that would leak for days. Time has now passed and we have once again realized that water is a precious commodity. People in our village are now directing spilled water from their taps to their gardens for irrigation. People are also making sure broken pipes are quickly repaired and that children know to turn off the tap when they are finished.

by Melissa Perry, Oyugis, Kenya

The biggest effort my community has made in conserving water is by building roof catchment water tanks on their houses. Other than this there is no conservation of water.

by Bryce Sitter, Mobile Clinic, Kajiado, Kenya

Water is carried from far, and it often takes the whole day to do this task. Usually, every other day is spent water the cows and filling jugs to be carried back to home. Water is recycled as much as humanly possible. Sometimes water is used four or five times and by then it contains soups, dirt, grease, and food. When water gets scarce people move. Women carry water and also use donkey to carry it.

by Barbara Hinsman, Vigeze Village, Vihiga, Kenya

Surprisingly, there is little conservation of water in Vihiga. During the dry season when water is really scarce, people tend to use less water for washing clothes, watering plants, and cleaning the house. They also eat more fried foods rather than boiled, and drink more soda and milk than water.

I see, in fact, that the opposite of conservation is taking place. A lot of rainwater is wasted during the rainy season, which, if harvested and stored properly, could be available during the dry season.

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by Patrick Campbell, Mombasa, Kenya

People conserve water out of necessity. The supply is limited, and so what little water you have must be stretched to meet your needs. One of the most common forms of recycling (or reusing) water is to use water from rinsing clothes to wash the floors afterwards.

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by David Frommell, Bagoo, Rift Valley Province, Kenya

Water conservation occurs on a small scale in rural homes. Water used for laundry may be used again to wash floors, while water used to wash hands before meals in reused to wash dishes.

Families with running piped water are less likely to conserve or recycle water than are families that fetch water manually from a nearby river, reservoir or well. As a community, the people of Kericho Town employ a modern wastewater treatment facility. The treatment plant collects water from combined sanitary and storm water sewers, treats the water with physical (settling solids) and biological (trickling stone filter, digestion bad) methods, and discharges the clean water to the nearby river. This type of modern sewage treatment is uncommon for towns like Kericho in Kenya. Revenue from local tea growers and donations from international sponsors help to fund such modern undertakings.

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by Glenna Snider, Osorongai, Kenya

There is no conservation of water that I have observed.

The Environment and Agriculture

by Drew Denzin, Ololulunga, Kenya

The quality of water in our village is extremely poor. Water is not looked at as something that can be polluted. Thus, the locals will often bath and go to the bathroom in the same place where they collect water for drinking/cooking; cattle have also polluted the river with their manure. In addition, erosion is taking place due to the planting crops on soil that cannot support them. With poor soil quality a large rain easily washes out the crops. With dirt roads that are washed out by rains, all the silt goes directly into the river.

by Kendall Rondeau, Miharati, Kenya

Farms around this area have joined together in huge water projects benefiting hundreds of people per project. They have built intakes in the mountain rivers, bringing piped water to many farmers. Although this seems like good development and progress, especially helping women, I have noticed some detrimental effects. The river water is not measured or monitored. Anyone who has money can join a water project and so, as time passes, more and more people are drawing on the rivers. Some rivers have become seasonal from too much use. They dry up in the hot months when we have no rain.

Another detrimental effect is that farmers along rivers and streams farm right up to the very edge of the waterway. They do not follow the law requiring 8' of natural, indigenous vegetation to be left along the river edges. This farming up to the banks of the rivers leads to erosion, especially following hard rains (which we have almost daily). The rivers are filled with silt and chemical run off, damaging the water quality as well as its plant and animal life.

These contaminated rivers flow for miles and miles, picking up more contaminates as they pass through farms and towns. People who drink directly from these rivers often get sick. The main illnesses are typhoid and worms.

by John and Kim Shumlansky, Mt. Kenya National Forest, Kenya

Our water originates from within a protected national forest. The pipeline then flows through a government owned tea plantation to where it reaches Kangaita. No major changes in the community or the environment have affected the quality of the water.

by Bryce Sitter, Mobile Clinic, Kajiado, Kenya

We are suffering from contaminated water in many sources. The water contains fecal matter

from cows and humans. Sources are not always protected, and animals defecate in the water. This spreads germs and disease. We lost 12 people due to cholera in a village to the south of me. This is directly linked to water.

A few small enterprise businesses have started here in Kenya. A large tanker truck does waste disposal of pit latrines with a large pump. Unfortunately there are no regulations on dumping, and wastes are dumped next to streams and foot trails, where they get into contact with people. There are also flower and chicken farms popping up in the area. This is because labor and land are cheap. There are no regulations on dumping or chemical use, and they also pollute the ground and water. They even had the fluoride and chlorine taken out of the water because it wasn't good for their flowers. Those two chemicals are put in water to kill germs in the water and to protect your teeth. We also don't have the money or resources to fix or maintain wells and pumps. If they break down, they often sit that way for a long time.

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by Barbara Hinsman, Vigeze Village, Vihiga, Kenya

Two major environmental concerns, which have greatly damaged water quality, are deforestation and agriculture. For the most part, agricultural techniques in Vihiga are low input and low impact, especially compared to those in the U.S. Still, farmers regularly use fertilizers and pesticides, which eventually end up contaminating the watershed. In addition, soil erosion from cultivating Vihiga's steep hills increases sedimentation in the rivers.

The problem is soil erosion is augmented by the dangerously high deforestation rate. Hills that were covered with indigenous forest three years ago are now bald, with no trees left to prevent the soil from washing into the rivers to be deposited in Lake Victoria. To compensate for the lack of fuel wood, the Maragoli people plant blue gum trees, of the Eucalyptus species. Unbeknownst to most Maragoli, these trees are very thirsty; they require a lot of water. A popular place to plant trees is near rivers, where the land is too swampy to cultivate. Now these "swamps," or wetlands, no longer exist due to the eucalyptus trees that drink up all the water. This is very unfortunate, considering that wetlands are natural filtering and cleansing systems for watersheds.

Damage to water quality by deforestation and agriculture is greatly exacerbated by population expansion. With a population density of over 1100 people/km2, Vihiga is incredibly overcrowded and still growing. As the numbers rise, water quality declines even further due to more human and livestock waste, more garbage thrown on the streets, more land being intensively farmed, more agricultural chemicals being used, and more trees being felled. So far, the only steps I've seen taken to the increase the availability of clean water (not necessarily to actively improve water quality) are protecting springs and building pumps to access ground water before it becomes severely contaminated.

by Patrick Campbell, Mombasa, Kenya

The supply of water has not kept up with demand. The system in place to supply water was not designed to support a population of five hundred thousand people. Ninety percent of the time I only have water until 9 AM, and then against at about 8 PM. Maintaining the system is also an issue, which is made more difficult by people who break pipe to steal water as they do not have an adequate supply in their area.

Treating the water has helped to create a decline in the spread of water borne illnesses. However the treatment is sometimes inadequate. The lack of water causes people to turn to sources that are less safe as well. The result is that there are still outbreaks of water borne illnesses.

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by David Frommell, Bagoo, Rift Valley Province, Kenya

Long before any of our grandparents were in school, tropical forest, and lush marshland covered the hills of Kericho District. The Kipsigis tribe lived among the hills, herding cattle and producing indigenous crops. During the early 1900's, European missionaries arrived in Kenya at the forefront of a powerful wave of white settlers. This event forever changed the landscape of Kenya, and Kericho District in particular. The foreign settlers noted the high potential of Kericho as a tea production area. The abundant rainfall, cool temperatures, and morning sunshine were perfect for the sensitive tea bushes. Companies such as Brooke Bond Kenya and African Highlands began clearing the forest and planting acre upon acre of tea. Today hundreds of square kilometers of land rest under a monoculture of some of the world's finest tea bushes.

Establishment of the tea industry came with benefits and drawbacks. Many jobs, high income, and increased education helped the people of Kericho to become comparatively wealthy among Kenyans. The District's surface waters suffered, however, from increased siltation caused by deforestation. Chemical fertilizers and pesticides now make the once clean waters appear grayish-brown. Dams and water intakes restrict water flows, resulting in algae blooms on the slow-moving waters upstream of such structures. Today the tea estates make considerable efforts to pursue organic tea farming techniques. The establishment of Kericho as an economic center, however, and the explosion of agriculture in their fertile region, continue to damage the waters. Today the people of Kericho have need for sophisticated water and sewage treatment facilities to clean the waters of what used to be a clean, natural water system.

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by Glenna Snider, Osorongai, Kenya

Many people are aware that clean water is important to good health, but it is difficult to put into practice. Women are mainly responsible for all the chores, including collecting firewood for cooking. It becomes difficult to find the time to boil drinking, so they just drink the water directly from the rivers and damns. New technologies have had little effect on my community.

Health and Nutrition

by Drew Denzin, Ololulunga, Kenya

Our drinking water is not fresh and many people (including our students) take no precautions to make sure it is safe. Many times we have seen our students dip their cup in the river and drink it. They don't believe that it can make you sick. Our community does nothing to purify the water, though some more educated people use chlorine or boil the water before drinking/cooking. As stated earlier, many people do not invest in gutters and tanks to collect rainwater. Most just go to the river for water (which is something Jen and I can't understand). While rain is scarce, the water is much cleaner.

Our water is contaminated by pesticides from nearby large scale farms, manure, human wastes, erosion of soil--just about anything you can think of (many people rinse out petrol cans in the river as well). Most people here seem to have amazing immune systems. But water borne diseases and sickness from contaminated water are common.

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by Kendall Rondeau, Miharati, Kenya

Those who have piped water have fresh water. That water comes straight down the mountains and is hardly contaminated. But there is a village of squatters in Wanjohi that is very poor. They fetch from the Wanjohi River, which comes a long way through farmland before heading toward the Wanjohi town. Health officials here often comment that the villagers "let the silt settle down to the bottom and then say the water is clean!" Typhoid outbreaks are common. Obviously they are not boiling their water; if you ask, however, they'll assure you that they are. Fortunately most people drink only chai--a hot tea which requires boiling. Otherwise I think there would be more typhoid outbreaks.

Many days walking home I see small children (and sometimes--even adults) stop at the river for a quick drink. School children fill their water bottles. I try to explain about typhoid but usually the people just shrug at me and continue to drink.

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by John and Kim Shumlansky, Mt. Kenya National Forest, Kenya

Our water is fresh and clean but it is not treated enough to remove all the possible disease-causing organisms. The intake structure contains a series of screens and filters that remove the larger particles of dirt, stones, and debris from trees and other vegetation that fall into the stream. It also keeps crabs, insects, and even frogs from getting into the pipeline. Unfortunately the screens are not able to keep out the microscopic organisms from animal droppings, insects, and bacteria. Therefore many people in the village take the precaution of boiling all drinking water.

Some people still feel "immune" to disease and drink the water directly from the tap. Since the water appears clean they believe it is healthy. It can often take some time before everyone learns that clear, clean-looking water doesn't always mean that the water is free from disease causing microorganisms. Drinking and bathing in contaminated water can result in illnesses that can keep people from doing their work and making a living. Contaminated water can also cause death and greatly impact the development of our community.

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by Melissa Perry, Oyugis, Kenya

My water usually comes from a spring that is protected and well-maintained by the Kenya Red Cross so it should be fairly safe drinking water, however I still boil my water and then filter it. Most of the families in my area boil their water for drinking.

Since I've been Oyugis, there has been a small outbreak of typhoid fever, which comes from water. There has also been a cholera outbreak. Cholera causes severe diarrhea and it can lead to death within a few days. This affects people in the very rural areas more often.

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by Bryce Sitter, Mobile Clinic, Kajiado, Kenya

The goats and cows can't get nourishment from the grass, they don't give milk and are susceptible to disease. We constantly get boils, scabies and other skin problems from not properly washing. We must boil our water, and a few filter it. The spring of Kilimanjuro is surprisingly clear, but it runs through miles of pipes before I see it. The Masai have lived here for years and years and still can't be convinced to boil or filter the water. Their immune systems have adapted, and they are very tolerant of living with worms, stomach bugs, and other water-borne diseases. When collecting water they simply scatter the green algae at he surface and fetch the water just under the surface. It is rude to reject a gift offering of tea called 'chai,' and I have been sick from drinking bad water or eating uncooked meat. I'm surprised, though how much more tolerant of sickness I've become since coming here.

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by Barbara Hinsman, Vigeze Village, Vihiga, Kenya

Although tap water and rain water look, smell, and taste clean, I boil and filter water from both sources, just to be safe. Surprisingly more Kenyans in my area also boil their water before drinking it, but filtering is uncommon. I have heard some mamas complain that to boil water takes too long and requires too much fuel. This explains the high incidence of dysentery among Kenyans. I once heard that one third of Kenyans have permanent amoebic dysentery without even realizing it, due to its cyclic nature of making one feel sick for a few days and then fine for a few weeks before becoming active again. Drinking river water can be especially dangerous, because both human and livestock waste, plus various chemicals from surrounding farms contaminate it. I was told by a friend never to eat sugarcane (which is eaten raw) that grows near a river, because I will become sick. Even cattle that graze near some rivers can become very ill.

Most people here do know the importance of clean drinking water. Many women and children walk very long distances daily to a clean water source, such as a protected spring, rather than use the river water that runs through their back yards. Rainwater is considered to be very clean. Families often save their money for years in order to build a roof catchment system, which collects the rain in gutters and directs it to a large storage tank. If water becomes a concern throughout the community, villagers will sometimes pull their resources together and, often with the help of a NGO or an aid organization, they will collectively build a water pump and storage tank for use by all.

Those who have access to clean water are usually generous with it as well. One of my farmers, Mr. Edalia, owns one of the only water tanks in his village. During a time of drought, or on any occasion when large amounts of water are needed (like a wedding or funeral), Mr. Edalia graciously allows other villagers to come and collect water from his tank. He claims his 1000-L tank stores enough water to supply his family year-round, plus a little extra for the community when needed.

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by Patrick Campbell, Mombasa, Kenya

The piped water in my area is treated, making it relatively safe. Many of us boil our drinking water as an added precaution. The two most common forms of contamination here are from sewage and salt water. Contaminated water affects people who are limited in their options and sources of water.

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by David Frommell, Bagoo, Rift Valley Province, Kenya

The water works in Kericho Town draws water from a freshwater river in the Mau Forest, a gazetted (protected) forest. The community takes great measures to ensure a clean water supply. The forest intake is 15 to 20 kilometers from town, deep in the forest; the treatment works sits about 13 kilometers from town center. These distances prevent contamination by pollution from farms and industries.

The Mau Forest is owned and protected by the Government of Kenya. Development, farming, and tree harvesting are forbidden by law within the Forest, which lies almost entirely within Kericho District. The treatment works was built at great expense, considering the distances involved for moving water. A German corporation sponsored and funded the multi-million dollar construction project, which is now managed by the Town Council. The wealth of Kericho Town related to water is immeasurable.

Unfortunately, the municipal water supply fails to reach every home in the District. Many families are forced to use local streams, wells, and springs for their water heads. Many communities form self-help groups, which undertake water projects to protect local sources from contamination or to construct rooftop rainwater catchment systems. Such groups make direct investments of money, time, and sweat to provide themselves and their children clean water.

Families which cannot afford to invest in protected water supplies use water drawn from sources which may be contaminated with pesticides, viruses, bacteria, or protozoa. Those with enough resources boil their water using wood, kerosene, propane gas or charcoal. Others drink unboiled water, commonly resulting in illnesses such as cholera, typhoid, amoebiasis, giardiasis, and other forms of dysentery. Such diseases claim many lives and adversely impact Kericho's productivity, whether measured in school days, agricultural output, or work hours. Although my local community is blessed with well-designed water facilities, much work is needed to ensure a safe water supply for the entire district.

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by Glenna Snider, Osorongai, Kenya

Most of the water supplies in my area are contaminated. Animals are free to drink from the water sources, and there are no safeguards to prevent other wastes from washing into the water collection points. There are many families that do not have pit latrines, so human waste is also a problem. It is very important that Public Health workers live in communities such as where I live, so they can teach on a daily basis, the importance of water sanitation.

Other Uses of Water

by Glenna Snider, Osorongai, Kenya

There are no water sports. The rivers are strong and deep; most people fear the fast current, as they have never learned how to swim.

Young children enjoy bathing in the hot sun, using water their mothers have put in basins. They really enjoy their baths when they have soap!

Recreation

by Drew Denzin, Ololulunga, Kenya

Water is only used for bathing, drinking/cooking, and watering cattle. We have not seen anyone enjoying the river recreationally. Children entertain themselves in other "land locked" ways.

by John and Kim Shumlansky, Mt. Kenya National Forest, Kenya

It is rare to find children playing in the streams by our village because the water is too cold. Kangaita is located about one degree south of the equator but is also at about 9000 feet above sea level. At this altitude, Kangaita is one of the coldest inhabited areas in Kenya. Furthermore, the water in the streams by Kangaita originates from the glaciers on Mt. Kenya and the water does not warm up much on its short journey to our village. The temperature of the water helps to keep it clean, but it is way too cold for children to play and swim in.

by Melissa Perry, Oyugis, Kenya

Since water is sometimes scarce in my community, children don't play games with water. Most small children are brought to a stream nearby with their mamas and they bathe in this stream. During this time the children swim and play in the water.

by Bryce Sitter, Mobile Clinic, Kajiado, Kenya

The last time it rained I did see kids playing in some water. It is also one of the few times I saw cars being washed.

by Barbara Hinsman, Vigeze Village, Vihiga, Kenya

I rarely see water being used for recreation by Maragoli people. In fact, many people I know are afraid of water and do not know how to swim. This may be due to the lack of ponds and lakes in the immediate area. It is interesting to compare the Maragoli to the Luo people in that respect. The Luos, who have lived on the shores of Lake Victoria since they arrived in East Africa thousands of years ago, are very fond of water. Every time I go to Kisumu, a nearby city on the Lake, I always see naked Luo children splashing about in ponds by the side of the road. When Maragoli people who live only 20 km (13 miles) away see this, they think it is very funny and inappropriate behavior. I imagine the Luos also laugh when they learn of Maragolis who are afraid of water and swimming. It is amazing to think that these two tribes still have opposite personalities despite the fact that they lived in such close proximity to each other for so long.

by Patrick Campbell, Mombasa, Kenya

Living on the ocean, many people will of course swim. Most of the water recreation on the coast is enjoyed by tourists who have the time and the money to sail, windsurf, snorkel and dive.

The locals will fish, but more as a source of food and income than a source of recreation.

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by David Frommell, Bagoo, Rift Valley Province, Kenya

Water-based recreation is uncommon in Kericho District. In rural communities where the local water source is the nearby river or stream, children can often be found bathing and splashing in the water.

Kericho Town boasts only one operating swimming pool, which is fenced in at the exclusive Tea Hotel. Built by the Brooke Bond Kenya tea company, the luxurious hotel sits above the Brooke Bond tea fields approximately one kilometer from Kericho Town Center. The hotel, originally used by the white owners of Brooke Bond to house visitors from the United Kingdom, is now owned and managed by Kenyans.

Transportation

by Drew Denzin, Ololulunga, Kenya

Our river, which varies greatly in height during the rainy/dry season, is a tributary to larger rivers, so transport isn't possible.

by Kendall Rondeau, Miharati, Kenya

People here do not use the rivers for transport or travel. Instead, they use it as a car wash. A lorry (truck) will pull up into a shallow part of a river and five guys will jump out and begin washing. Oil, grease and dirt float downstream. People also wash their bikes in the rivers because our roads are extremely muddy and bikes become clogged with mud. I've washed my bike in the river a few times. You have to be quick, though! The water is so cold it numbs your hands and feet!

by Melissa Perry, Oyugis, Kenya

I live near Lake Victoria--inland about 30 km. Many of the people in my community go to the lake to purchase fish to sell. There are many fishermen on Lake Victoria. In the bay areas the fishing boats are used to transport goods and people to surrounding areas. Currently, on Lake Victoria there is water hyacinth growing on the lake making it difficult to fish, travel, and transport. An American organization has come to help rid the lake of the weed by bringing machines that will chop the weed.

by Bryce Sitter, Mobile Clinic, Kajiado, Kenya

Kajiado means the long river. I have never seen water in it though. The cement factory harvests sand and limestone from the dry riverbed, and for certain seasons one can dig deep in the riverbed and access water as it seeps though the sand. I've been told that during El Nino, this area saw rains that were not of normal amounts, and the river could not sustain it. Many people were caught in the flash flooding as bridges washed out. The soil could not absorb the water, as it is too rocky.

by Barbara Hinsman, Vigeze Village, Vihiga, Kenya

I live about 20 km (13 miles) north of Lake Victoria, the second largest freshwater lake in the world (Lake Superior is the largest). The Maragoli people who inhabit the rocky hills of Vihiga have a spectacular view of the lake, yet few are aware of its existence so nearby, and most have

never walked on its shores. The Maragoli do make use of various streams in Vihiga, which feed into Lake Victoria. None of these waterway are large enough for transportation however.

A different tribe of people, the Luo tribe, live on the shores of Lake Victoria and utilize its waters in their daily lives--for drinking, bathing, fishing, and transportation. Unfortunately these activities, especially transportation and fishing, have been greatly inhibited by the water hyacinth, an exotic plant that reproduces very rapidly, keeping boats from passing. An American environmental firm has just arrived to mechanically remove this water hyacinth, which should free the water again for the Luos to carry on with their traditional lifestyles.

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by Patrick Campbell, Mombasa, Kenya

Mombasa is the major port for East Africa. For centuries it has been a center of trade. From Vasco de Gama to imported vehicles today, the port is a center of activity. Looking out across the sea, you can see fishing boats in the distance, and huge trade ships from all over the world on the horizon.

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by David Frommell, Bagoo, Rift Valley Province, Kenya

Among the hills of Kericho District run many rivers and streams. Natural springs arise from underground along hillsides and rock outcroppings. Kericho's waterways remain too small for transportation purposes, however. The only man-made things transported by the rivers are trash, chemical pollutants, and sediment carried by erosion from improperly maintained farms and roads.

Other Stories

by John and Kim Shumlansky, Mt. Kenya National Forest, Kenya

It was an exciting time when our new water system was finally finished and water began flowing to the village. This excitement continued for about a week before we woke one day to find no water in the pipes. As the children went out to the stream with their jerry cans to collect water, a few of the village men accompanied us into the forest to see what had caused the water to stop running. As we followed the buried pipeline through the thick forest growth, we came up on an area where trees were uprooted and the ground was completely overturned. The elephants had apparently come through the night before.

The pipes had been properly buried so that nobody would mess with them, but they had not been safe from the herd of 20 to 25 elephants that had come sliding down the hill, one after another, each taking away more and more of the dirt that covered our pipes. The pipes lie halfway down a steep hill and thus the weight of the sliding elephants and the slope of the land had soon eroded the one-foot of dirt that protected the pipes. Once the pipe was uncovered, it was inevitable that it would be shattered. When we arrived at the scene of the elephant crossing, a large footprint could be seen over the broken spot where water was pouring down the hill.

The following day we called together about 30 members of our village to re-bury the pipeline. This time we made sure that at least three feet of dirt covered every part of the pipeline. Burying the pipeline for a second time was hard work, but certain precautions are necessary when you live among elephants.

Anthony Wachira Gachi is the person responsible for repairing the water system in Kangaita when it is disrupted or broken. Anthony was an invaluable source of information for the previous questions. Anyone interested in asking Anthony questions about the village water system can write him at: Kiranja Primary School, c/o Francis Munene, P.O. Box 220, Kerugoya, Kenya.

by Melissa Perry, Oyugis, Kenya

As you look at the names of the people in the pictures you will notice many have the same name. The tribe in my area is Luo; they are considered fishermen since they come from the lake area. The Luo tribe names their children by the time of day they were born. My Luo name is Atieno because I was born late at night. A girl's name starts with an A and a boy's name begins with O.

by Bryce Sitter, Mobile Clinic, Kajiado, Kenya

Kenyans can buy second hand clothes, tools and devices, and are always willing to accept anything. They are very good at fixing things and getting by without things we rely on. Learning to live here meant learning to go without things I thought I needed. But, it is also considered rude to write a note or letter on the back of "scratch paper." Likewise, a new plastic bag is given to a customer who buys fruits or vegetables in the market. There are no garbage bins or proper places to put trash, and plastic litters the area like an art exhibit. New modern conveniences like aluminum cans, and cardboard are causing trash and littering, where a few years ago things were wrapped in banana leaves.

When you get into a car, it is likely to be a jalopy. They are repaired over and over. I've even held the door shut and watched the road pass me through holes underneath my feet. The Kenyans are so friendly, that it takes me an hour to walk the 4 K to town, constantly greeting people. They are loving and social and very giving. They ask many questions about America. I was once asked if I have ever ridden in the space shuttle. Everyone knows your business, and if there is need, the community comes together to raise money, show respect, or help someone celebrate. I will someday have to return here to again see my friends of Kenya.

by Patrick Campbell, Mombasa, Kenya

The handicapped in Kenya are severely disadvantaged by cultural superstitions and a social welfare system that is desperately underfunded. In Embu, a town two hours north of Nairobi in the foothills of Mt. Kenya, I lived next to an orphanage/ school for handicapped children that was started by the Red Cross. After a day of consulting business I would often come home and kick a soccer ball around to unwind. After a while I noticed I had an audience of children shyly peeking through the fence. In Swahili I invited them to join me, and two of the bravest crawled under the fence. One by one others began to sneak in and join us, and soon I was surrounded by a dozen laughing children. These kids receive daily reminders of what they can and cannot do as a result of their condition. I'm sure if they would have asked, someone would have told them they would never be able to play soccer. With no one there to tell them they couldn't, they decided to see if they could. They hopped, crawled, and limped around swinging their legs at the ball, hitting it with their crutches, or kicking it with their good leg, overjoyed by the chance to be kids. After six months in Embu I was informed that I was transferred to Mombasa. I wrote letters to family and friends asking if they had any soccer equipment they were able to donate to my friends. In the end they decided to donate money instead to avoid the logistics of shipping equipment eight thousand miles. On the day I left I present the kids with ten soccer balls and two pumps. I could hardly get them to stand still for two minutes so I could take a picture to send home to the donors. Now I live in Mombasa, a city of five hundred thousand people and I hardly ever get to kick the ball around anymore. Though I enjoy living on the coast and working with handicapped, I often think of the friends I left behind in Embu. If I listen carefully, I can still hear their laughter.

by David Frommell, Bagoo, Rift Valley Province, Kenya

Late on a rainy Thursday night during May, I lay in bed with violent stomach pains and fever. Another Volunteer passing through town was staying with me, and was concerned enough to suggest we seek medical attention.

Near midnight, the neighbors I had known for only several weeks sprung into action, notifying the doctors and arranging for a vehicle to get me to the hospital which was nearly two hours away. At 12:30 AM I waved good-bye to my new, sleep-deprived neighbors as my cab left the gas station.

Arriving at the hospital at 2:00 AM, the doctor diagnosed me with appendicitis. Six hours later I was flown to Nairobi, Kenya's capital city for emergency surgery. That same day, my neighbors organized for a trip to the first hospital I went to that rainy night. They had no idea they would not find me there since I had been transferred to Nairobi. Yet they spent hundreds of Kenya Shillings and a day of their time to show support to the young American man whom had become their neighbor six weeks earlier.

I had not expected such sacrifice from the people of Kenya, who have little time or money to spare. Yet after living in Kericho for seven months, I have learned that such good deeds are common among my neighbors. I feel blessed to live in a community that values friendship so highly.

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by Glenna Snider, Osorongai, Kenya

On January 1, 1999, I assisted a young woman with the birth of her baby (who was about one month premature). Here is an excerpt from a letter I mailed to my mother describing the event:

Sunday, Jan. 3, 1999

Dear Mom,

The past couple of days have been very eventful. I am taking advantage of the quiet, as everyone (or most everyone) is preparing to go to church. On Friday afternoon, Alex, and then Caroline, came to tell me that a young woman had come to the dispensary, and that she was very sick. Raphael had gone to a wedding, so there was no one to see her. Alex and Caroline seemed unusually concerned, so I decided to find out where this woman was, and if there was anything I could do to help.

She was kneeling in the grass, complaining of chest pains, and coughing. She was also pregnant, but not full term. I didn't really know what to do. After a few minutes, she said she needed to go to the latrine. As we stood up, she appeared to be having a contraction, and there was evidence that her water had broken.

Caroline ran to send someone to bring Raphael, and someone else to go for the midwife. I started walking with (Helen) toward the latrine. After a few steps, she suddenly cried out, lifted her skirt, and pulled at her underwear. I squatted down facing her, holding her hands, and told her to push. The placenta was already coming out; within about three minutes, a very small, lifeless form slipped out onto the grass. I picked the baby up (a baby girl, although I did not know that until later...no time to look). She was like a slippery rag doll. No sign of life; she was completely motionless. I turned her over onto her stomach, face to the ground, and gently whacked her backside--nothing. I flopped her around, pushed on her stomach and chest, trying get her to breathe. She remained totally lifeless. I called to Caroline that I needed help, that I needed to get the baby to breathe. Helen was still squatting, watching, silent. I was hardly aware of her. The realization hit me at the same time that this baby might be stillborn, and that I wasn't going to get any help. In a kind of desperation, I opened her mouth and stuck my finger in, trying to clear a path, and trying to remember how to do mouth to mouth on someone that tiny. As I pulled my finger out, her mouth moved, in what looked like a reflex gag kind of movement. I started talking to her then--"Come on! I know you are alive, Breathe! Come on..." I put her over on her stomach, patted her back--nothing. I whacked her a little harder, as Caroline had returned, and was calling to me "Alex says to hit it hard on the back." People had started to gather, but were staying at a distance. I was vaguely aware of a couple of children very close, watching. I stuck my finger down her throat again, because it was the only thing that worked. She sucked in a small breath. I turned her over, patted her back, and then opened her mouth again with my fingers. She started breathing, very small, soft breaths. She did not cry. I looked at Helen; we were still squatting in the grass, facing each other. I told her, "Your baby is alive." I called to Caroline that the baby was alive, and to bring a blanket. She ran to the house where Alex had put on a pot of water to boil and praying. Caroline told her to continue praying.

Rhoda, Helen, Magdalene, and a couple other village women came forward with cords and a razor blade. One old woman insisted that the mother had to dig a hole and bury the placenta. Caroline grabbed the jembe and started digging. I took Helen by the arm, lifted her up, and said, "She is coming with me." Rhoda had the baby. We brought them to my place and cleaned up the baby (who was still not crying, but was at least breathing). Helen bathed, and put on some clean clothes that Caroline brought over. We fixed a bed for Helen and the baby, on the floor in my room. The baby never cried until about 5:00 AM the next morning, and still had not nursed. I heated some water so Helen could wash her face, and cleaned the baby, who was wet. I gave Helen some ugi (porridge) then had her sit up in a chair to nurse. The baby finally started sucking; it was after 7:00 AM, over twelve hours since she had been born...

After it was all over, Alex told me that he had come out when the baby (later she was named Sharon Jepchumba) started breathing, and moved a group of children back. His daughter, Alison, had apparently been right at my side, and had seen the whole thing. He said, "She was really amazed. She just kept saying 'Mtoto, Mtoto,' over and over..." Helen and Sharon Jepchumba came to visit me two weeks ago. Sharon is now ten months old. She is wide-eyed and chubby; a beautiful toddler. Her birth will always remain a highlight of my experience in Kenya.

Photos from Tanzania

TZ0102
A Girls' Secondary School student is watering the vegetables in the school garden. This is part of the students' afternoon duties.

by Lorie Burnett
Girls' Secondary School,
Korogwe, Tanzania (1999)

TZ0103
Girls from the Girls' Secondary School in Korogwe carry buckets of water to the garden.

by Lorie Burnett
Girls' Secondary School,
Korogwe, Tanzania (1999)

Photos from Tanzania

TZ0108
In Old Korogwe, a village next to the town of Korogwe, a woman does her laundry on her doorstep.

by Lorie Burnett
Old Korogwe, Tanzania (1999)

TZ0109
This young boy fills his morning bucket from this faucet in Old Korogwe village.

by Lorie Burnett
Old Korogwe, Tanzania (1999)

Photos from Tanzania

TZ0111
The well not only serves as a provider of water, but also an area for socializing.

by Lorie Burnett
Old Korogwe, Tanzania
(1999)

TZ0114
A student from the Korogwe Girls' Secondary School brushes her teeth at the wash station.

by Lorie Burnett
Korogwe Girls' Secondary School,
Tanzania (1999)

Photos from Tanzania

TZ0115
All of the Korogwe Girls' Secondary School students use these stations for washing and bathing purposes.

by Lorie Burnett
Korogwe Girls' Secondary School, Tanzania (1999)

TZ0202
Rains come once a year in this area of Tanzania (the rest of the country gets two rainy seasons), so the plants like this baby banana tree must be watered frequently.

by Gary Port
Dodoma, Tanzania (1999)

Photos from Tanzania

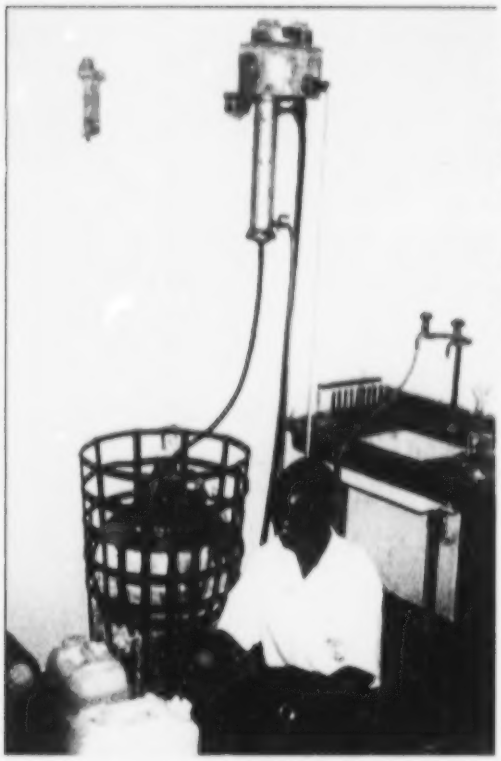
TZ0204
With the help of fellow PCV Mardi Brinck, this inexperienced water carrier, PCV Abby Gustafson, attempts to carry a bucket of water (which is less than have full) on her head. A piece of cloth (kanga) is rolled into a pad for extra comfort, and is placed between the bucket and her head.

by Gary Port
Dodoma, Tanzania (1999)

TZ0208
This is PCV Gary Port with three of his students, Mohamed Ngondai, Agajile
John, and Emma Suluba, in the chemistry lab. The lab is outfitted with running water at all the lab benches.

by Gary Port
Mzumbe Secondary School,
Morogoro, Tanzania (1999)

Photos from Tanzania



TZ0209
Mohamed Ngondai is filling the container with distilled water from the distillation machine above him. The distilled water will be used in the lab classes.

by Gary Port
Mzumbe Secondary School,
Morogoro, Tanzania (1999)

TZ0216
PCVs Tracy Addis and Amanda Riles stand with some of the local men by an irrigation ditch used to water the fields.

by Gary Port
"Mt. Meru, Arusha",
Tanzania (1999)

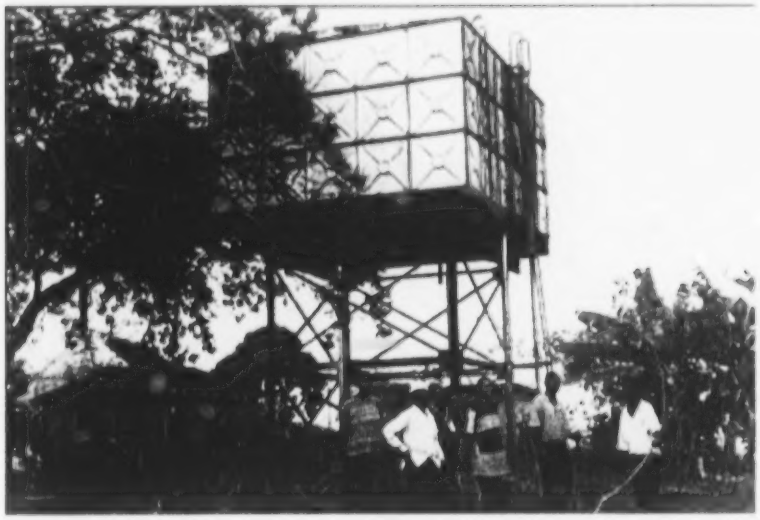
Photos from Tanzania

TZ0217
PCV Amanda Riley stands by an irrigation ditch that is laid with cement to prevent erosion.

by Gary Port
"Mt. Meru, Arusha", Tanzania (1999)

TZ0219
This large water tank provides pressurized water for the students of Mzumbe Secondary School. These are some of my students posing beside the water tank.

by Gary Port
Mzumbe, Tanzania (1999)



Stories from Tanzania

Water and Culture

by Gary Port, Morogoro (Mzumbe), Tanzania

Here is a folktale told to me by one of my Form VI chemistry students, Abdulrahim Omari, (equivalent to first year college). It is called "The Hare and the Water."

Once upon a time there was a village known as Singino. Many different animals--such as the elephant, giraffe, antelope, buffalo, hare, lion, tortoise, hyena, and wolf--lived in Singino. The giraffe was their king.

One day there was a shortage of water in the village. There were no natural springs and not enough rain. This was a big problem. King Giraffe called a meeting of all animals in the village to discuss how to solve the problem of water. They all agreed to dig a well which, they believed, would provide enough water for all. But Mr. Hare was against the idea. He didn't want to dig.

All the animals gathered together and dug the well. Mr. Hare did not help; instead he laughed at the animals as they were digging.

Within a short time, the animals had good, clean water. King Giraffe, however, prohibited Mr. Hare from using the well water.

Since Mr. Hare could not get water, he decided to trick the animals. He went to the elephant who was on duty to guard the well and said, "I have some honey, which is very sweet. Would you like to taste it?" The elephant tried some and, liking it very much, asked for more. Mr. Hare said, "I will give you more honey, but first I have to tie your hands and legs. You will enjoy it even more this way." Mr. Hare then tied up the elephant and jumped into the well. He drank some water, swam, and ran away laughing and laughing.

King Giraffe was very angry to hear that Mr. Hare tricked the elephant. The next day, King Giraffe made the antelope the well guard, but Mr. Hare tricked him too. The king tried each of the animals in the village, and the hare tricked each and every one of them. The king was furious.

Finally, it was tortoises' duty to guard the well. He sat inside the water waiting for Mr. Hare to come. The Hare eventually came and proudly jumped into the well thinking that there was no guard at all. But the tortoise caught him and took him to the king, who punished Mr. Hare severely.

Ever since then, the animals have lived in peace, enjoying their clean fresh well water.

The Source of your Water

by Lorie Burnett, Korogwe, Tanga Region, Tanzania

At my house I have indoor plumbing. The water comes from the river or nearby hills, the former by some pumping mechanism and the latter by gravity. When my water is cut off, I'm not sure if it's because of an actual water shortage if it's because there's not enough water strength to reach my house, or if it's due to rationing. No one seems to be able to answer this. Few people here have running water in the house, but many get it from a spout centrally located on a street. A lot of people have houses that are equipped for plumbing, but still have no running water. During the dry season, fewer and fewer taps actually work. On several occasions last year, the school truck had to go off campus with loads of containers to fill up and bring back to school.

There have been a few months when water was very scarce, and I have truly been in fear of having to send someone down to the river for my water.

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by Gary Port, Morogoro (Mzumbe), Tanzania

In my town, Mzumbe, water is piped in from a small village about ten kilometers away, located in the Uluguru Mountains. We have two rainy seasons, November/December (short rains) and March through May (long rains). Apparently, it rains enough to keep the river flowing all year to supply both my town (about 2000 people) as well as some local villages.

The water in the pipes is cool and clean. However, due to occasional cholera outbreaks, all water is boiled before drinking (even Tanzanians boil their water).

There have been a few times this past year when the pipes got clogged at the source. They had to turn off the water for a few days. When this happened, we were forced to take the school truck to the river and fill up five gallon buckets. This was done during class time so the students missed lessons.

Daily Usage

by Lorie Burnett, Korogwe, Tanga Region, Tanzania

I use water here for the same things I do in the U.S.--drinking, cooking, bathing, washing clothes, and watering plants. The difference is that I am much more conscious of how much I use, since it is a valuable commodity. For about two months of my first year here, there was no water coming out of the taps. I had to keep my two 100 liter storage containers filled with water and paid people to carry water from the tap at school (about half a kilometer away). I became acutely aware of how much water I used! Even when it's not the dry season, I try to find multiple uses for water. I water the trees I've planted outside with dishwashing water. I flush the toilet with bath water or water I've used to wash clothes. When I shower I catch water in a basin. I try to use water sparingly.

When my sister came to visit, we stayed in fancy hotels for a few days and I indulged myself in a few baths (something I used to love at home). But I didn't enjoy it as much because I kept thinking about how much water I was using, and what a waste it was! I'm quite sure that I only use a fraction of the water I'd use at home--cold showers just aren't as leisurely as warm baths--and I'm sure that washing clothing in buckets uses less water than a washing machine.

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by Gary Port, Morogoro (Mzumbe), Tanzania

For me, water use isn't much different here than back in the United States. In my home, I have a flush toilet (that actually uses more water than a gallon flush toilet back home) and I take showers daily (although with only cold water). Laundry takes up most of my water during the rinse (about ten gallons for one small load).

In my community, many teachers at my school have fields with corn, tomatoes, banana trees, and other plants. They usually water them with a hose and sprinkler or else dig small irrigation trenches and turn on the faucet. People here use water to clean floors ("kupiga deki" which means "to hit the deck"). After sweeping the cement floors, a towel is soaked and used to mop up.

At school during the dry seasons, students have to fill buckets of water and wet the dirt patches so not a lot of dust is stirred up. We also use quite a lot of water in my chemistry lab (usually distilled water) for experiments and cleaning up.

One thing I haven't seen yet is kids having water fights, or running through sprinklers. Maybe it hasn't occurred to them. I've seen some Tanzanians swim in the river, but it seems to be rare.

A dam was built in my town a few year ago and the reservoir is now used to raise fish to sell in the market.

Managing Water

by Lorie Burnett, Korogwe, Tanga Region, Tanzania

Every day I see a woman with a bucket on her head fetching water from some distant location to take home. This seems to be purely women's work within the family, though some of the people I paid to fetch water for me were boys.

There is no irrigation to speak of here; people rely on the rains. Recent El Nino, and La Nina weather changes have caused disruptions in planting and have sometimes harmed crops.

by Gary Port, Morogoro (Mzumbe), Tanzania

My secondary school is in charge of their own water and the lines that run from the source. They were built back in the early 1960s. Now the headmaster (equivalent of principal) is in charge of sending plumbers to repair breaks and leaks.

The teachers at my school are also small-scale farmers who grow corn, tomatoes, etc. Officially, they are supposed to get permission to use the school water for gardens, but they just use it.

Conservation

by Lorie Burnett, Korogwe, Tanga Region, Tanzania

Although there is mandatory rationing by the water department, people seem to be wasteful of water, which is surprising since it is so hard to come by. For example, it is a custom to mop the floor every day. This seems unnecessary especially if water is scarce. But it's what people do. When I lived with a Tanzanian woman for two months, she seemed to use a lot of water and made no effort to re-use it. This might be because it was coming from a tap. Perhaps in other circumstances she would have been more careful (that is, if she had to fetch water from a river herself).

by Gary Port, Morogoro (Mzumbe), Tanzania

Luckily, there haven't been any shortages in my town, but during the dry season, water pressure is lower and is turned off periodically. The community is usually told where they can find water for personal use and for farming. There is no recycling.

The Environment and Agriculture

by Lorie Burnett, Korogwe, Tanga Region, Tanzania

World Vision is working on a catchment dam project designed to catch rainwater. This is supposed to improve the village's water supply (not in my village, Korogwe, but in another town).

by Gary Port, Morogoro (Mzumbe), Tanzania

Since the installation of new pipes as well as the construction of water towers in my town (both to store water and to provide water) the quality of water has been much improved. People can now devote more of their time to other things (like education) instead of fetching water from the river.

As far as the environment is concerned only a very limited amount of pollution has taken place, from plastic bags which clog pipes to the insecticides farmers use in the mountain. But overall, the quality of water hasn't changed drastically.

Health and Nutrition

by Lorie Burnett, Korogwe, Tanga Region, Tanzania

Water comes from pipes and is clean except in the beginning of the rainy season when it is visibly muddy. During those times, I sift the water through a T-shirt and then let the rest settle to the bottom of the storage containers. I always boil water for drinking, but all other water--including water for brushing my teeth--I just use straight from the tap.

I have seen people gathering water from stagnant looking ponds and I am fairly sure that for people in the villages, without electricity, it is not customary to boil water. This is mostly due to the lack of knowledge of the importance of boiling water. Further, boiling water would require even more firewood, an often-precious commodity that people carry for great distances.

Occasionally, there are outbreaks of cholera or typhoid due to the "contaminated" water but I have not yet witnessed one of these.

I lived with a host family in Ausha who was well-off by Tanzanian standards. They boiled their drinking water. I imagine this is the case among people who are educated and who have the financial means.

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by Gary Port, Morogoro (Mzumbe), Tanzania

The drinking water is usually very clear, but still unsuitable for immediate drinking due to the contamination by cholera. All water here is boiled before drinking. A few years back an attempt was made to treat the water with chlorine. A container of chlorine was placed in the large storage tank with a timer to release a certain dose periodically. But the people found that this process was too expensive and too high of a concentration of chlorine was needed to sterilize the water. Also, the water didn't sit in the tank long enough before people used it. They eventually returned to just boiling water. The trouble with boiling, however, is that heating enough water for over 1,500 people everyday takes a lot of firewood and energy so it is quite expensive and wasteful. Some of the poorer families can't afford this so they risk cholera infection drinking unboiled water.

When a cholera outbreak occurs here it's a very dangerous and serious matter. Last year a few local people died of the disease.

Recreation

by Lorie Burnett, Korogwe, Tanga Region, Tanzania

There is a swimming pool that is attached to the hydroelectric plant but it seems to be patronized only by the expatriate and Indian communities here. I once took my host family there but they were terrified because they can't swim.

by Gary Port, Morogoro (Mzumbe), Tanzania

I've seen some boys though swimming in the river near my home. This river is our water source. There is a deep spot where they like to jump in--sometimes even doing flips. However, I don't think water sports are common because not a lot of Tanzanians live close enough to a lake or the ocean. Pools are very scarce here and difficult to keep clean. They are usually expensive so only Wasunsu (white people) can afford to use them.

Transportation

by Lorie Burnett, Korogwe, Tanga Region, Tanzania

We are not near a river, but the closest one is not used for transportation.

I am about sixty miles from the coastal city of Tanga, which is an important port here for exporting goods as well as transport to Kenya and to the islands of Reinba and Zanzibar.

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by Gary Port, Morogoro (Mzumbe), Tanzania

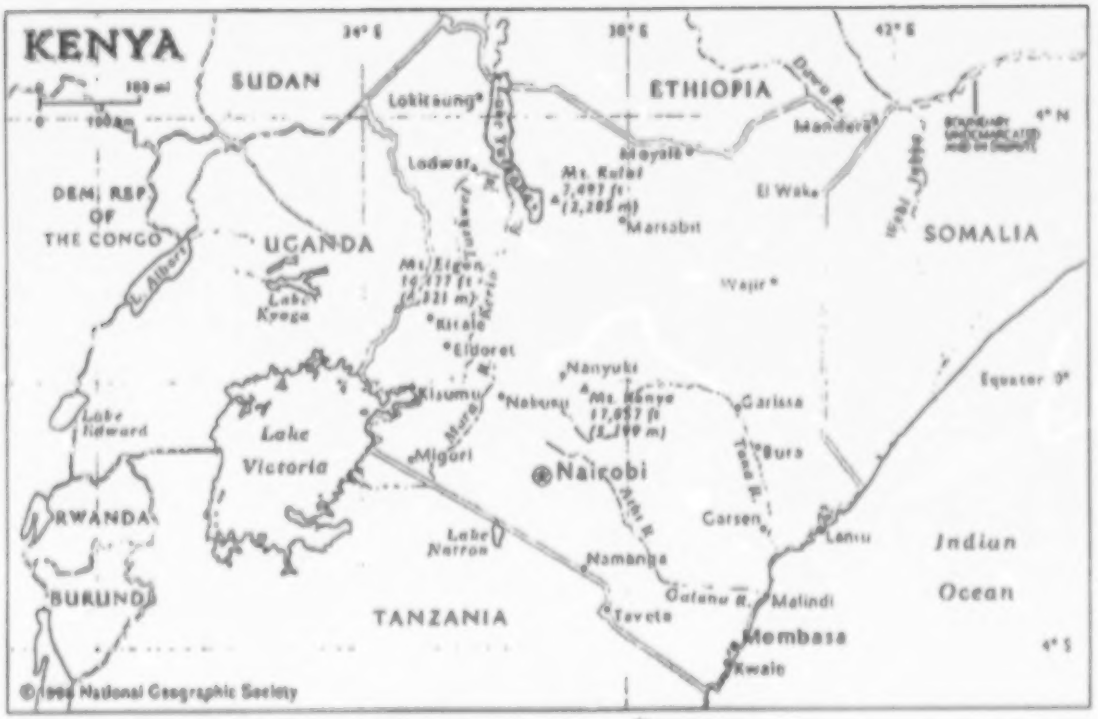
I live near a small dam used for breeding fish and a small river which is our water source. Neither are used for transportation.

Three hours away though, in Dar Es Salaam--the "unofficial capital"--ships transport goods from abroad. The locals use "dohws," a wooden sailboat with a single sail made from cloth.

Other Stories

by Lorie Burnett, Korogwe, Tanga Region, Tanzania

One day I was walking from my house to school, which is a ten-minute walk. All of a sudden, rain began to pour and, of course, I had no umbrella. I was carrying a big bag of school books. I ran and ducked into an alcove to wait it out, feeling cold and soaking wet. The rain didn't seem to be letting up at all and I debated as to whether to just make a run for it and go to my class, or to wait it out. Then I saw two of my Form I students (8th grade) coming with a huge umbrella. They had seen me shivering there and came to help me make it to class.



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Name _____

Date _____

My Water Log

Directions: This log will help you identify how you use over the course of one day. Put your name and the date at the top of the paper. Then think about all the times today when you used water, either directly; like getting a drink or washing your hands, or indirectly; like eating breakfast with orange juice made with water. Try to remember the time of day when you used water and how long the activity lasted for you.

Now use the log below to record all your water-related activities for today. Put the time, a description of the activity and an estimate of the amount of time you spent at the activity.

Time of Day	Water Related Activity	Amount of Time Spent
(Sample) 7:15 A.M.	Drank orange juice	2 minutes

Name _____

Date _____

Time of Day	Water Related Activity	Amount of Time Spent

Name_____ Date _____

Research Graphic Organizer

Directions: You can use this graphic organizer to help you record what you learn about villages in rural Kenya and Tanzania, and how children use water there. When you look at the photos and stories from Kenya and Tanzania, you will notice that there are ways and times that children use water that are the same as how you use it, and some ways and times that are different. Look at the sample entry. (KE0210) and the categories above the sample entry (Source, Activity, etc.) Notice how the entry goes with each category title. **Source** is the photo or story you use. You can use initials to abbreviate the story title, author, and country, as your teacher will show you in the example by Barbara Hinsman. **Activity** is exactly what the children are doing. **Time Spent** is how long it takes them to do the activity. The **Feature of Culture** you select is taken from our class list. For the category, **Same /Compare** tell how the activity is the same as our region and for **Different/Contrast** write notes that tell how the activity is different from our region.

Source	Activity	Time Spent	Feature of Culture	Same/Compare	Different/Contrast
KE0210	Boy filling water jug at pump	5 minutes (est)	Technology	Clothes washing	Hand washing Fetching water

Name_____ Date _____

Source	Activity	Time Spent	Feature of Culture	Same/Compare	Different/Contrast

Name _____

Date _____

Evaluation of Your Essay

This evaluation rubric on the right will help you understand what you need to do when you write your essay. It tells how the essay will be evaluated. You can see that establishing a topic for the paragraphs, and keeping to the topic is an important factor in the evaluation. Use the chart to help you make sure you include everything you need in your two-paragraph essay.

Essay Requirements

Remember that the requirements for the essay are to compose two paragraphs that compare and contrast water use by children in villages in Kenya and Tanzania with water use by children in our region of the United States. The paragraphs must:

- Contain six examples of water use
- Consider these factors:
  - Time spent
  - Types of activities
  - Number of activities
- Use the stories and photos from Kenya and Tanzania as sources
- Cite two features of culture from our list.

Essay Rubric

Area	Points	Descriptors
Content Accuracy	/30	The student: • Used six examples of water use in the essay. • Used photos and stories as sources and presented the material accurately. • Compared and contrasted time spent, types, and number of activities.
Content Depth	/20	The student: • Used material from Kenya and Tanzania in the paragraphs. • Used two or more features of culture in each paragraph.
Process	/10	The student: • Used the Research Graphic Organizer and the Water Log to frame the work.
Presentation and Neatness	/30	The student: • Used topic sentences. • Stayed on the topic identified in the topic sentence. • Used correct spelling, punctuation, and grammar. • Excluded unnecessary information.
Creativity	/10	The student: • Interpreted and presented the data in an original manner.
Total	/100	

Name _____

Date _____

Evaluation of Your Pictures

This evaluation rubric on the right will help you understand what you need to do when you draw your pictures. It tells how the pictures will be evaluated. You can see that both the content and creativity of your pictures are important. Use the rubric to help you make sure you include everything you need in your picture.

Picture Requirements

Remember that the requirements for the picture are to create two pictures (one for each paragraph), that illustrate the examples you used in your paragraphs about water use and children's lives. The pictures must:

- Illustrate two features of culture from our list
- Use the stories and photos from Kenya and Tanzania as sources
- Be supported by at least two examples of water use from the photos or stories from Kenya and Tanzania.
- Must not focus on isolated incidents in the source materials.

Picture Rubric

Area	Points	Descriptors
Content Accuracy	/30	The student: • Used Kenya and Tanzania as sources. • Illustrated examples cited in their essay. • Used a minimum of two sources for each picture.
Content Depth	/20	The student: • Showed the role of children. • Used two or more features of culture in each picture.
Process	/10	The student: • Used a partner or group to refine ideas.
Presentation and Neatness	/20	The student: • Presented ideas neatly. • Paid attention to margins (as needed). • Used captions (as needed).
Creativity	/20	The student: • Used media, techniques and processes to present ideas clearly. • Used original methods of portraying ideas.
Total	/100	

Tanzania Photo and Story Reference Chart

Directions: This chart gives the best examples of photos and stories that show water usage by Tanzanian children and young people from the Water in Africa Web site (http://www.peacecorps.gov/wws/water/africa/tanzania/). Be sure to read the stories carefully, because only one part of the story may be about water and children. Write down what you learn on your Research Graphic Organizer. See the graphic organizer for directions and a sample.

Photos:

TZ0102, TZ0103, TZ0109, TZ0114, TZ0115 TZ0208, TZ0209, TZ0219

Stories

Daily Usage	Health and Nutrition	Managing Water	Recreation	Source of Your Water	Other Stories
Gary Port	Gary Port	Lorie Burnett	Gary Port	Gary Port	Lorie Burnett
Water and Culture					
Gary Port					

Kenya Photo and Story Reference Chart

Directions: This chart gives the best examples of photos and stories that show water usage by Kenyan children and young people from the Water in Africa Web site (http://www.peacecorps.gov/wws/water/africa/kenya/). Be sure to read the stories carefully, because only one part of the story may be about water and children. Write down what you learn on your Research Graphic Organizer. See the graphic organizer for directions and a sample.

Photos:

KE0210, KE0335, KE0434, KE0512, KE0621

Stories

Daily Usage	Health and Nutrition	Managing Water	Recreation	Other Uses of Water	Other Stories
Barbara Hinsman	Drew Denzin	Barbara Hinsman	Drew Denzin	Gnella Snider	John and Kim Shumlansky
Melissa Perry	Barbara Hinsman	Melissa Perry	David Frommell		
John and Kim Shumlansky	Melissa Perry	Kendall Rondeau	Barbara Hinsman		
Bryce Sitter	Kendall Rondeau	John and Kim Shumlansky	Melissa Perry		
		Glenna Snider	John and Kim Shumlansky		
			Bryce Sitter		

The Iceberg

Class time needed: 30 minutes

Materials: "Features of Culture" handout for each student

Objectives

- Students will identify features that all cultures have in common.
- Students will understand that culture includes visible and invisible features.

Introduction

Culture has been compared to an iceberg. Just as an iceberg has a visible section (one-ninth of it) above the waterline and a larger, invisible section below the waterline, culture has some aspects that you can observe and others that you can only imagine or intuit. Like an iceberg, that part of culture that is visible (observable behavior) is only a small part of a much bigger whole.

Procedure

1. Draw a large iceberg floating in the sea on the board. Ask students: What do you know about icebergs? Emphasize the fact that most of the iceberg is hidden from view.

2. Ask students to look over the "Features of Culture" handout. Explain that this list presents some of the features all cultures have in common. Pictures of people involved in everyday activities in various parts of the world will help you illustrate this idea.

3. Ask students to identify those features from the list that they can see in the behavior of people and those that are invisible. As students share their ideas, record them above or below the waterline on your iceberg drawing.

4. Point out that there is a relationship between those items that appear above the waterline and those that appear below it. In most cases, the invisible aspects of culture influence or cause the visible one. Religious beliefs, for example, are "seen" in certain holiday customs, and notions of modesty influence styles of dress. Ask students to find other examples of this from the iceberg representation of culture.

Debriefing

Use the following questions to help students understand how the "Features of Culture" can be used to enhance their understanding of other cultures.

1. Does it make sense to compare culture to an iceberg? Can you think of other things to which the visible and invisible features of culture can be compared?

2. A Peace Corps Volunteer serving as a teacher in Mongolia had this to say about some photographs she sent to a group of students in the United States.

   Mongolians are very serious and composed in their expressions. In the city, this is beginning to change slightly. You'll see a number of my students smiling. But this is not traditional. When I first came here, my friends asked me why Americans smile so much. They felt that Americans smile even at people they don't like and that this was quite insincere.

   - Lisa Buchwalder

   What does this tell you about the visible and invisible features of culture? Does it explain why people from different cultures sometimes misunderstand each other?

3. Can you match this description of American and Mongolian behaviors to any of the items on your list of cultural features?

4. How can a list such as "Features of Culture" help you understand differences among people? (Possible answer: Differences may seem less strange or unusual when we understand them as variations on fundamental characteristics that all cultures have in common.)

Extending the Ideas

If your class is corresponding with a Peace Corps Volunteer through World Wise Schools, share the "Features of Culture" list with your volunteer and ask him or her describe some of the visible and invisible features of the host country.

Revisit the first activity in this section. Ask students to match items from the "Everyone Has a Culture--Everyone is Different" worksheet to items on the "Features of Culture" list.

Features of Culture

1. facial expressions
2. religious beliefs
3. religious rituals
4. importance of time
5. paintings
6. values
7. literature
8. child-raising beliefs
9. ideas about leadership
10. gestures
11. holiday customs
12. ideas about fairness
13. ideas about friendship
14. ideas about modesty
15. foods
16. eating habits
17. understanding of the natural world
18. concept of self
19. the importance of work
20. concept of beauty
21. music
22. styles of dress
23. general world view
24. concept of personal space
25. rules of social etiquette
26. housing